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(54) DEVICE AND METHOD FOR APPLYING HOOKS OR CLIPS TO THE SLATS OF VENETIAN BLINDS WITH FOLDED EDGES PROVIDED WITH ABUTMENT GASKETS

(57) The invention relates to a device for applying hooks or clips to the slats of Venetian blinds. It comprises a guide for positioning a slat L on a reference plane m and at least a first matrix 10 that defines a seat 13 designed to receive a portion of an edge of the slat Bl. The seat 13 is formed at the interface between a first 11 and a second portion 12 into which the first matrix 10 is divided. These two portions are movable in relation to the reference plane m between a closed position, wherein the two portions are positioned alongside each other to close the seat around the portion of edge and at least one open position, wherein the two portions are distanced from one another to open the seat and thus free the movement of the slat. A first portion 11 of the matrix is provided with a projecting appendage 15 destined to skim the edge of the slat. In passing from the open position to the closed position, the first portion 11 is movable so as to move this projecting appendage from a position outside the track 2 to an inside position of the track, so that this appendage crosses the edge of the slat, remaining in the half-space 02 not occupied by the slat and tangent to the reference plane m. This invention also covers a method of applying hooks.

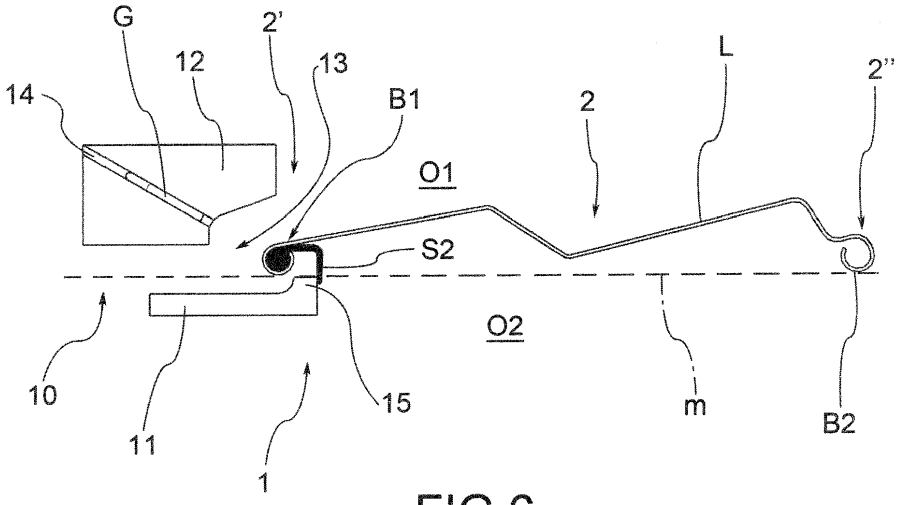

FIG.6

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Description

Field of application

[0001] This invention covers a device and method for applying hooks or clips to the slats of Venetian blinds with folded edges provided with abutment gaskets.

State of the art

[0002] As is known, Venetian blinds are constituted by a plurality of slats, arranged parallel to each other and maintained in position by string support structures. These structures are essentially of two types.

[0003] A first type of structure is called "complete ladder", i.e., constituted by two parallel ribs (arranged in the direction of the height of the blinds) and a plurality of crosspieces that connect them to each other at regular distances. A slat is associated to each crosspiece, supported (if the crosspiece is single) or inserted (if the crosspiece is multiple).

[0004] A second type of structure is called "separate ladders" or "semi-ladder", i.e., constituted by two cords separated from each other and each provided with a plurality of string eyelets, distributed at regular distances along the single cord. The support cords are positioned in pairs on opposite sides of the slats, generally transversely aligned. The cords are associated to the slats at the eyelets using clips or hooks fastened on the side edges of the slats themselves. The slats, which may have any section such as C, Z or S-shaped, must have folded edges B (as shown in Figure 1) so as to constitute a reinforced zone capable of rigidly supporting a hook or clip.

[0005] In a Venetian blind slats come into contact with each other at the longitudinal edges. To prevent wear or scraping of the slats at the contact points and reduce noise resulting from contact between the slats, abutment gaskets are inserted along the edges. Figure 2 shows a slat with folded edges provided with an abutment gasket S. More in detail, these abutment gaskets S are constituted by an elongated anchoring portion S1, which is inserted inside the folded edge of the slat, and a covering tongue S2, which extends from the anchoring portion S1 to cover the inside of the folded edge and protrude from the slat so as to be interposed between the slat and another slat in the contact zone.

[0006] Devices are known for the automatic application of the hooks or clips on the folded edges of the slats. These devices are constituted by a central guide A along which the slat L slides, as shown in Figures 3 and 4. Laterally to such a guide, a matrix M is positioned on each side to lock the folded edge of the slat. This matrix consists of two movable parts, which are coupled together to grip the edge of the slat in a locking seat D.

[0007] A first part M1 of the matrix is arranged on the outside side of the slat and a carries a hook feeder A and a pusher element P. The pusher element P is guided to enter inside the locking seat D defined by the two parts of the matrix, carrying in front of itself a single hook to apply to the edge. The hooks are positioned placed in front of the head of the pusher element through a chute C connected to the feeder A. The second part M2 of the matrix is arranged on the inner side of the slat, below it, as shown in Figures 3 and 4.

[0008] Such devices, although very efficient and reliable, however, are nevertheless not suitable for the application of hooks on slats with folded edges provided with abutment gaskets S. When applied on the edge of the slat, the hooks would pierce the entire gasket S, including the covering tongue S2, locking the latter against the edge of the slat. This reduces the flexibility of the tongue S2, accelerating wear over time and thus reducing functionality.

[0009] There is therefore the need in the field of the production of Venetian blinds to have a device which allows the application of hooks or clips on slats with folded edges provided with abutment gaskets, leaving the covering tongues of the gaskets completely free from the hooks.

Presentation of the invention

[0010] Therefore, the purpose of this invention is to totally or partially eliminate the drawbacks of the prior art cited above, by providing a device and a method for applying hooks or clips on slats of Venetian blinds with folded edges provided with abutment gaskets that allows the application of hooks or clips on slats provided with abutment gaskets, leaving the covering tongues of the gaskets completely free from the hooks.

[0011] A further purpose of this invention is to make available a device for applying hooks or clips to the slats of Venetian blinds with folded edges provided with abutment gaskets that is both simple to manage and reliable.

[0012] A further purpose of this invention is to make available a device for applying hooks or clips to the slats of Venetian blinds with folded edges provided with abutment gaskets that is both simple and inexpensive to manufacture.

Brief description of the drawings

[0013] The technical characteristics of the invention, according to the above-mentioned purposes, can be clearly understood from the claims listed below and its advantages will become more apparent from the detailed description that follows, made with reference to the attached drawings, which show one or more purely exemplary and non-limiting embodiments wherein:

[0014] - Figure 1 shows a perspective view of an example of a slat with folded edges;

[0015] - Figure 2 shows an orthogonal side view of an example of a slat with folded edges provided with abutment gasket;

[0016] - Figures 3 and 4 show a device for applying

hooks of known type, in two different operating positions;

[0017] - Figures 5 to 10 schematically show the operation of a device for the application of hooks or clips on slats of Venetian blinds according to an embodiment of the invention.

Detailed description

[0018] With reference to the attached drawings, 1 indicates a device for applying hooks or clips to the slats of Venetian blinds with folded edges provided with abutment gaskets according to the invention.

[0019] As will be clearly described below, the device 1 according to the invention allows the application of hooks or clips on slats with folded edges provided with abutment gaskets, leaving the covering tongues of the gaskets completely free from the hooks.

[0020] Advantageously, the device 1 can be inserted into a unit for stacking slats on support semi-ladders for the production of Venetian blinds, and in particular, it can be inserted in the stacking unit covered by patent application No. PD2012A000061 in the name of the same applicant.

[0021] Here and in the following description and claims, reference will be made to the device 1 in condition of use. References to a lower or higher position must be understood in this sense.

[0022] According to a general embodiment of the invention, the device 1 for the application of hooks or clips on slats of Venetian blinds comprises a guide (not shown in the attached drawings) which defines a track 2 along which a slat L is positioned. In particular, along this track 2 the slat L is made to slide to bring different portions of the edge in correspondence to the matrix 10.

[0023] Operationally, the guide is suitable to position the slat L so that it is placed in one of the two half-spaces O1 and O2 defined by a reference plane m and in such a way that the slat L has its longitudinal edges B1,B2 positioned on this reference plane m. The half-space occupied by the slat is indicated with O1 in the attached drawings.

[0024] Preferably, in a condition of use, the above reference plane m is horizontal and the slat L is arranged above the plane, i.e., in the upper half-space O1. However may embodiments be envisaged in which this reference plane is not horizontal.

[0025] Still according to the above general embodiment, the device 1 comprises at least a first matrix 10, which is arranged in the vicinity of the track 2 and defines a seat 13 destined to receive a portion of a longitudinal edge B1 of the slat L.

[0026] This matrix 10 comprises at least one access aperture 14 to the seat 13. Through this aperture 14, hooks or clips G are made to enter into the seat 13 to be applied to the edge portion housed therein (as can be seen in the sequence of Figures 5 to 10).

[0027] Said seat 13 is formed at the interface between a first portion 11 and a second portion 12 in which the first matrix 10 is divided.

[0028] These two portions 11,12 of the matrix are movable with respect to the reference plane m between:

[0029] - a closed position, in which the two portions 11,12 are juxtaposed to close the seat 13 around the edge portion B1 so as to hold it locked in position and allow the application of at least one hook or clip (see Figures 7 and 8); and

[0030] - at least one open position, in which the two portions 11,12 of the matrix are distanced from each other to open the seat 13 and thus free the movement of the slat (see in particular Figures 5 and 10).

[0031] A first portion 11 of the matrix is provided with a projecting appendage 15 destined to skim the edge B of the slat.

[0032] Operationally, in passing from said open position to said closed position, the first portion 11 is movable so as to move this projecting appendage 15 from a position outside the track 2 (see Figure 5) to a position inside the track (see Figure 6), so that this appendage 15 crosses the edge B1 of the slat L, remaining in the half-space 02 not occupied by the slat and tangent to the reference plane m (see sequence Figures 5 and 6).

[0033] In this way, if the slat L is provided with an abutment gasket S with a tongue S2 covering the folded edge B, the appendage 15, with its movement from the outside position to the inside position, engages the covering tongue S2, moving the tongue away from the B1 and preventing it from being closed inside the seat 13.

[0034] From the above description it is clear how the device 1 according to the invention allows distancing a covering tongue S2 of a possible abutment gasket from the edge of a slat before the edge B1 is closed inside the seat 13 for the application of a hook or clip G. Operationally, when the first portion 11 is brought into the closed position together with the second portion 12 of the matrix, the covering tongue S2 is moved away from the edge through the interposition of the appendage 15 and, therefore, the application of a hook or clip cannot involve the tongue.

[0035] According to a preferred embodiment shown in the attached drawings, in said closed position, the appendage 15 of the first portion 11 of the matrix 10 defines, at least partly, the seat 13 in which the edge portion B is locked. In other words, the appendage 15 is positioned at the interface with the second portion 12 of the matrix. This costructional feature is advantageous in that it simplifies the structure of the first portion 11 of the matrix 10. In fact, the appendage 15 acts as both an interposition element between the edge B1 of the slat and the covering tongue S2, and a delimiting element of the seat 13.

[0036] Operationally, according to a preferred embodiment, the first portion 11 of the matrix 10 is moveable in such a way that, once the appendage 10 has been brought into said position inside the track 2, the appendage 15 passes beyond the reference plane m and moves at least partially into the half-space O1 occupied by the slat L, inserting itself between the edge B of the slat and

the covering tongue S2 (see sequence Figures 6 and 7).

[0037] Advantageously, when the first portion 11 is brought into the closed position, the appendage 15 (interposed between the edge B1 of the slat L and the tongue S2 of the gasket S) can be brought close to the edge, delimiting the seat 13.

[0038] Advantageously, the device 1 according to the invention comprises means (not shown in the attached figures) for moving the two portions 11,12 of the matrix between said open position and said closed position. Preferably such movement means are suitable to separately move the two portions 11 and 12 of the matrix 10. In particular, these movement means may comprise carriages associated to the two portions of the matrix and related actuator means.

[0039] Preferably, the movement of the two portions 11 and 12 of the matrix 10 is controlled by a logic control unit (not shown in the attached figures) that controls the movement means according to a predefined movement logic of the two portions, and in particular of the first portion 11.

[0040] As previously mentioned, in a condition of use, the reference plane m is preferably horizontal and the slat L is arranged above the plane. In this case, the first portion 11 of the matrix, i.e., the portion that carries the projecting appendage 15, moves and positions itself - at least in some operational phases - below the slat L, and, thus, "internally" to the slat (at least with the projecting appendage 15), while the second portion 12 is maintained "externally" to the slat.

[0041] Regardless of the spatial orientation of the reference plane m, in the closed position the first portion 11 of the matrix is always interacting with the inner surface of the folded edge of the slat. Here, "inner surface" means the surface facing towards the centreline of the slat itself, in contrast with the "outer surface", which is, instead, facing in the opposite direction. The application of the hooks or clips takes place in correspondence to the outer surface of the edge of the slat, since the hook or the clip must be placed on the outside edge in order to be associated to a supporting semi-ladder. On the inner surface of the edge - in the opposite position to the direction of application of the hook - the hook or the clip only grips to anchor itself firmly to the slat.

[0042] Advantageously, the first portion 11 of the matrix 10 is provided with one or more cavities open on the seat 13, which are suitable to guide the closing of a hook or clip G against the edge portion B. The access aperture 14 to the seat 13 (through which the hooks or clips are applied on the edge) is, instead, formed in the second portion 12 of the matrix.

[0043] Preferably, the device 1 comprises:

- a hook or clip feeder G (not shown in the attached figures) suitable for placing hooks in the matrix 13 at the access aperture 14; and
- a pusher element (not shown in the attached figures) suitable to engage the access aperture 14 to push a hook G positioned therein against the edge portion B closed in the seat 13.

[0044] Preferably, as shown in the attached drawings, said first matrix 10 is positioned on a first side 2' of the track 2 along which a slat L is positioned.

[0045] Preferably, the device 1 comprises a second matrix (not shown) structurally and functionally identical to the first at least as described above. This second matrix is arranged on a second side 2" of the track opposite to the first side 2'. This second matrix allows the application of hooks or clips on an edge B2 of the slat opposite to that on which the first matrix 10 can operate.

[0046] This invention covers a method for applying hooks or clips to the slats of Venetian blinds with folded edges provided with abutment gaskets.

[0047] Preferably, but not necessarily, the method is applied on a device 1 according to this invention.

[0048] According to a general embodiment, the method comprises the following operational steps:

a) positioning a slat L along a track 2 so that the slat is placed in one of the two half -spaces O1 defined by a reference plane m with its longitudinal edges B1,B2 positioned on such reference plane m;
b) preparing in proximity to the track 2, at least one matrix 10, is divided into a first 11 and a second portion 12.

[0049] At the interface between the two portions 11, 12, this matrix 10 defines a seat 13 to receive an edge portion B1 of the slat L. These two portions 11,12 of the matrix 10 are movable in relation to the reference plane m between a closed position, wherein the two portions 11,12 are positioned alongside each other to close the seat 13 around the portion of edge B1 so as to keep the latter locked in position and permit the application of at least one hook or clip, and at least one open position, wherein the two portions 11,12 of the matrix are distanced from one another to open the seat 13 and thus free the movement of the slat. The first portion 11 of the matrix is provided with a projecting appendage 15.

[0050] The method further comprises the following additional operating steps:

c) placing the two portions 11, 12 of the matrix in the above open position with the first portion 11 placed in such a way that the projecting appendage is placed in a position outside the track and thus the slat (see Figure 5);
d) moving the first portion 11 of the matrix so as to move the projecting appendage 15 from the outside position to an inside position of the track, so that such appendage 15 crosses the edge of the slat.

[0051] In the movement between the outside position and inside position, the appendage 15 is maintained in the half-space 02 not occupied by the slat and tangent

to the reference plane m so as to skim the edge. Thanks to this movement, the projecting appendage 15 engages the covering tongue S2 of the gasket S distancing it from the edge (see sequence Figures 5 and 6).

[0052] The subsequent steps of the method are the following:

e) moving the first portion 11 of the matrix so that, once the appendage 15 has been brought into said inside position, the appendage 15 passes beyond the reference plane m and moves at least partially into the half-space O1 occupied by the slat L, inserting itself between the edge B of the slat and the covering tongue S2;

f) bringing the two portions 11, 12 into the closed position, leaving the covering tongue S2 outside the seat 13; and

g) applying a hook or clip G to the portion of edge locked in the seat 13, without engaging the covering tongue since it is not closed inside the seat 13.

[0053] The cycle of steps can then be repeated by opening the seat 13 and sliding the slat along the track L so that a different edge portion is engaged in the matrix 10.

[0054] The invention allows obtaining many advantages in part already described.

[0055] The device and method for the application of hooks or clips on Venetian blind slats according to the invention allows applying hooks or clips on slats provided with abutment gaskets, leaving the covering tongues of the gaskets completely free from the hooks. In fact, thanks to the invention the covering tongues are distanced from the edges of the slats and maintained outside the matrix during the application of the hooks.

[0056] The device for applying hooks or clips according to the invention is also both simple to manage and reliable. In fact, the temporary distancing of the tongues is performed by the matrix itself, without the need to provided elements dedicated to this operation. This has the advantage of simplifying construction and ensures greater operational reliability.

[0057] For the reason explained above, the device 1 according to the invention is simple and inexpensive to manufacture. In fact, for the purposes of the invention, complex or costly technical solutions are not required.

[0058] Therefore, the invention thus conceived achieves the predefined purposes.

[0059] Obviously, it may even assume, in its practical embodiment, forms and configurations different from that illustrated above without, for this reason, departing from the present scope of protection.

[0060] Moreover, all the details may be replaced by technically equivalent elements and the dimensions, forms and materials used may be any according to the needs.

Claims

1. Device for applying hooks or clips to the slats of Venetian blinds , comprising:

   - a guide defining a track (2) along which a slat (L) is positioned, said guide positioning the slat so that the latter is placed in one of the two half-spaces (O1) defined by a reference plane (m) with its longitudinal edges (B1, B2) positioned on such reference plane (m); and
   - at least a first matrix (10) which defines a seat (13) destined to receive a portion of a longitudinal edge (B1) of the slat (L) and comprising at least one access aperture (14) to the seat (13) through which hooks or clips are made to enter said seat to be applied to the portion of edge housed therein, said seat (13) being made at the interface between a first portion (11) and second portion (12) into which the first matrix (10) is subdivided, the two portions (11, 12) of the matrix being movable in relation to the reference plane (m) between a closed position, wherein the two portions (11,12) are positioned alongside each other to close the seat (13) around the portion of edge (B1) so as to keep the latter blocked in position and permit the application of at least one hook or clip, and at least one open position, wherein the two portions (11,12) of the matrix are distanced from one another to open the seat (13) and thus free the movement of the slat, **characterised in that** a first portion (11) of the matrix is provided with a projecting appendage (15) destined to skim the edge (B) of the slat, in passing from the open position to the closed position said first portion (11) being movable so as to shift said projecting appendage (15) from a position outside the track to a position inside the track, so that said appendage (15) crosses the edge of the slat staying in the half-space (02) not occupied by the slat and tangent to the reference plane (m), if said slat (L) is provided with an abutment gasket (S) with a covering tongue (S2) of the edge (B) said appendage (15) engaging with its movement from the outside position to the inside position said tongue (S2) thereby distancing the tongue from the edge and preventing it from being closed inside the seat (13).

2. Device according to claim 1, wherein in said closed position the appendage (15) defines at least partially the seat (13) in which the portion of edge (B) is blocked, the first portion (11) of the matrix being movable in such a way that, once the appendage (15) has been brought into said position inside the track, the appendage (15) passes beyond the reference plane (m) and moves at least partially into the half-

space (O1) occupied by the slat (L), inserting itself between the edge (B) of the slat and the tongue (S2) covering the abutment gasket (S) where present.

3. Device according to claim 1 or 2, comprising means for moving the two portions (11, 12) of the matrix between the open position and the closed position.

4. Device according to one or more of the previous claims, wherein the first portion (11) of the matrix (15) is provided with one or more cavities open on the seat (13), which are suitable to guide the closing of a hook or clip (G) against the edge portion (B).

5. Device according to one or more of the previous claims, wherein the access aperture (14) to the seat (13) is made in the second portion (12) of the matrix.

6. Device according to one or more of the previous claims, comprising:

- a hook or clip feeder (G) suitable for placing hooks (G) in the matrix (13) at the access aperture (14) ; and
- a pusher element suitable to engage the access aperture (14) to push a hook (G) positioned therein against the edge portion (B) closed in the seat (13).

7. Device according to one or more of the previous claims, wherein said first matrix (10) is positioned on a first side (2') of the track (2) along which a slat (L) is positioned.

8. Device according to claim 7, comprising a second matrix, positioned on a second side (2") of the track opposite the first side (2'), said second matrix permitting the application of hooks or clips on an edge (B2) of the slat opposite that on which the first matrix (10) may operate.

9. Stacking unit of slats on support half-ladders for the production of venetian blinds **characterised in that** it comprises at least one device (1) for applying hooks or clips to the slats according to one or more of the previous claims.

10. Method for applying hooks or clips to the slats of Venetian blinds with folded edges provided with abutment gaskets, the latter comprising a covering tongue (S2) of the edge (B) of the slat, the method comprising the following operating steps:

a) positioning a slat (L) along a track (2) so that the slat is placed in one of the two half -spaces (O1) defined by a reference plane (m) with its longitudinal edges (B1, B2) positioned on such reference plane (m);

b) providing next to said track (2) at least one matrix (10) divided into a first (11) and a second portion (12), said matrix (10) defining at the interface between the two portions (11, 12) a seat (13) for housing a portion of edge (B) of the slat (L), the two portions (11, 12) of the matrix (10) being movable in relation to the reference plane (m) between a closed position, wherein the two portions (11,12) are positioned alongside each other to close the seat (13) around the portion of edge (B1) so as to keep the latter blocked in position and permit the application of at least one hook or clip, and at least one open position, wherein the two portions (11,12) of the matrix are distanced from one another to open the seat (13) and thus free the movement of the slat, the first portion (11) of the matrix being provided with a projecting appendage (15);

c) placing the two portions (11, 12) of the matrix in said open position with the first portion (11) placed in such a way that the projecting appendage is placed in a position outside the track and thus outside the slat;

d) moving said first portion (11) of the matrix so as to shift said projecting appendage (15) from said position outside the track to a position inside the track, so that said appendage (15) crosses the edge of the slat, in said movement the appendage (15) being kept in the half-space (02) not occupied by the slat and tangent to the reference plane (m),so as to skim said edge, with its movement from the outside position to the inside position the projecting appendage (15) engaging the covering tongue (S2) of the gasket (S) distancing it from the edge;

e) moving the first portion (11) of the matrix so that once the appendage (15) has been brought into said inside position, the appendage (15) passes beyond the reference plane (m) and moves at least partially into the half-space (O1) occupied by the slat (L), inserting itself between the edge (B) of the slat and the covering tongue (S2);

f) bringing the two portions (11, 12) into the closed position, leaving the covering tongue (S2) outside the seat (13);

g) applying a hook or clip (G) to the portion of edge blocked in the seat (13).

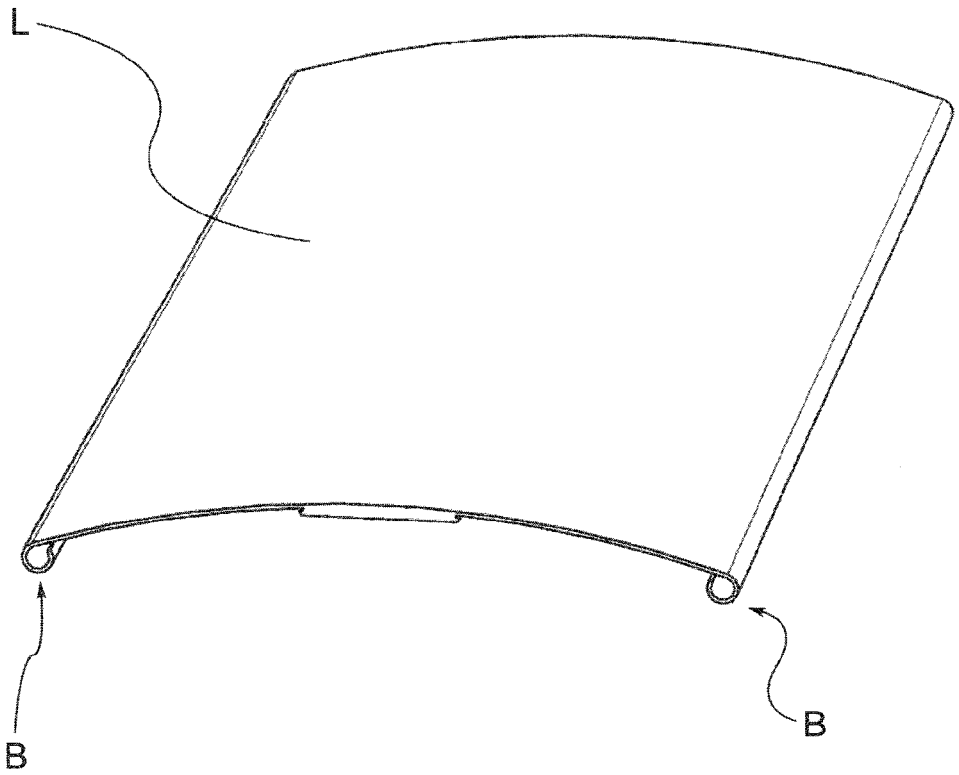


FIG.1

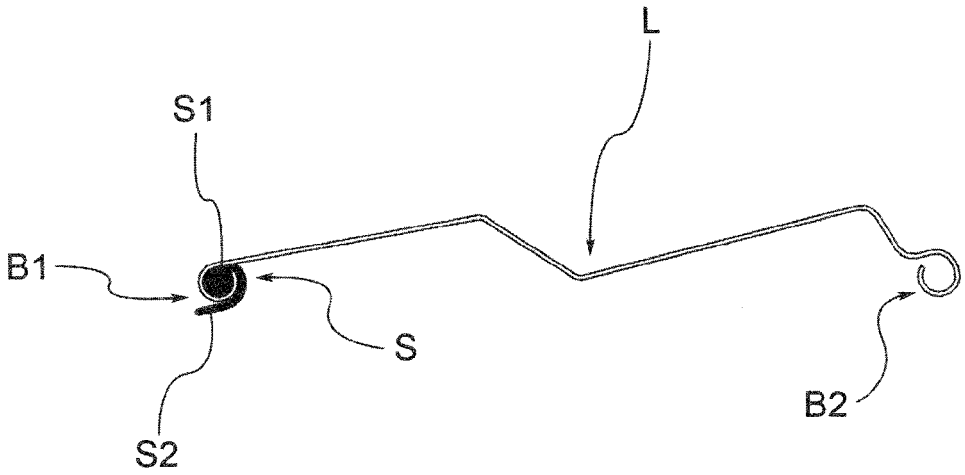


FIG.2

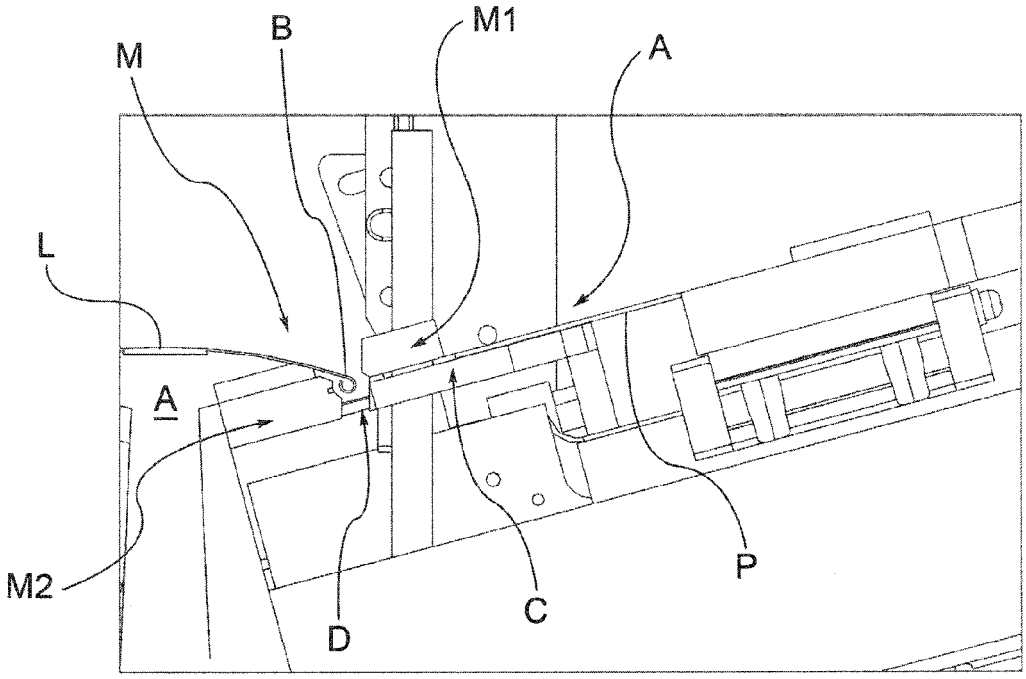


FIG.3

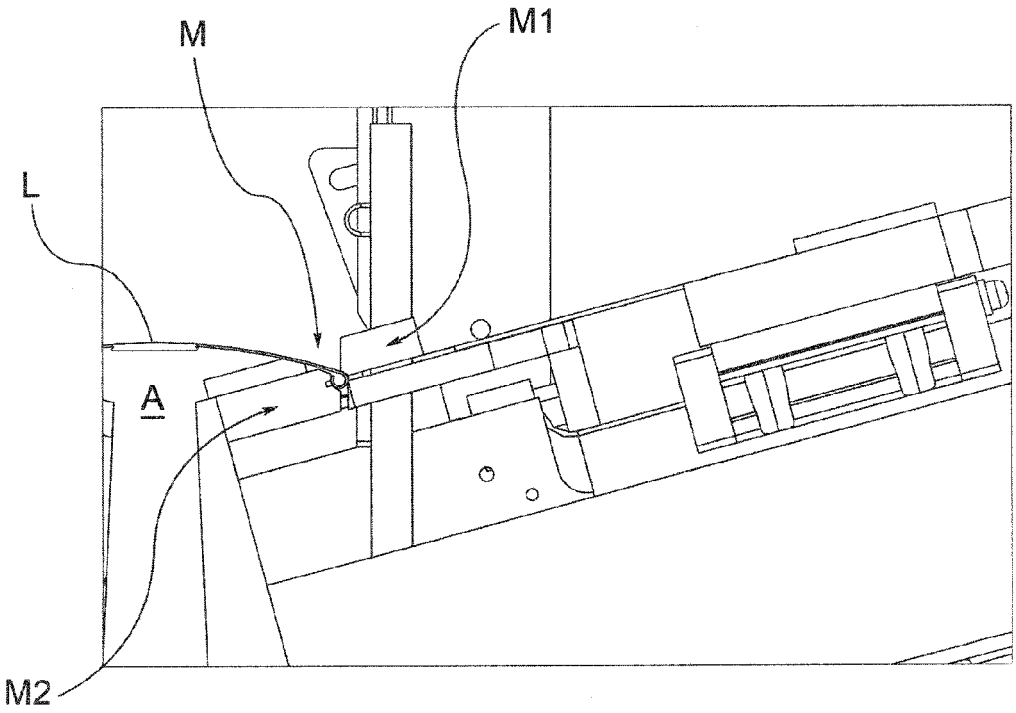
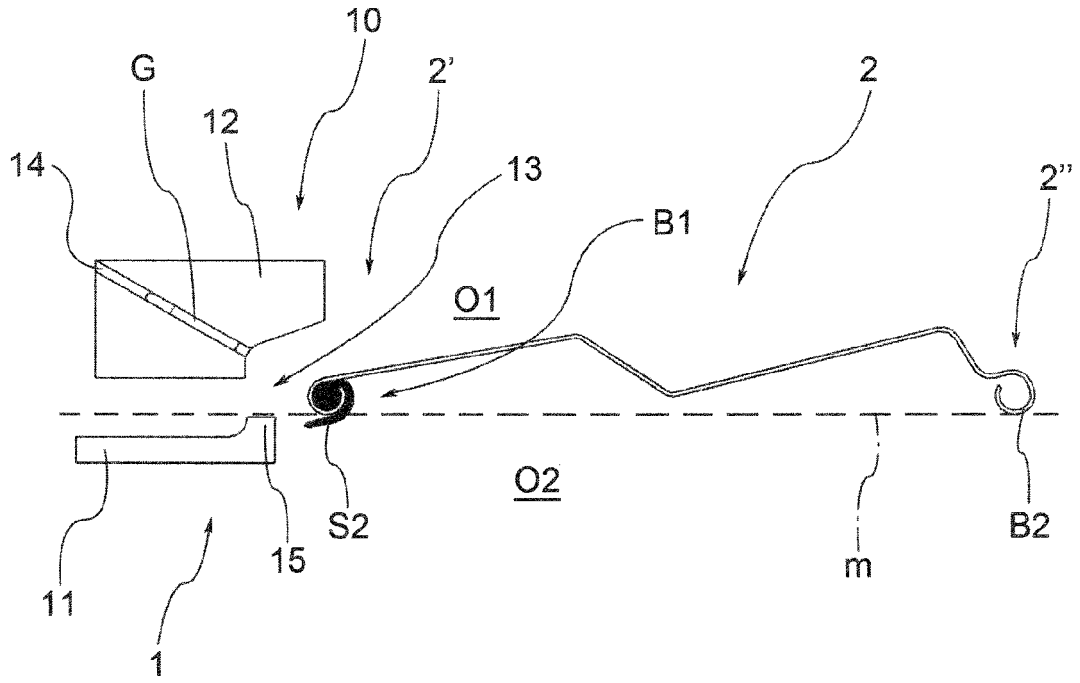


FIG.4


10
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13
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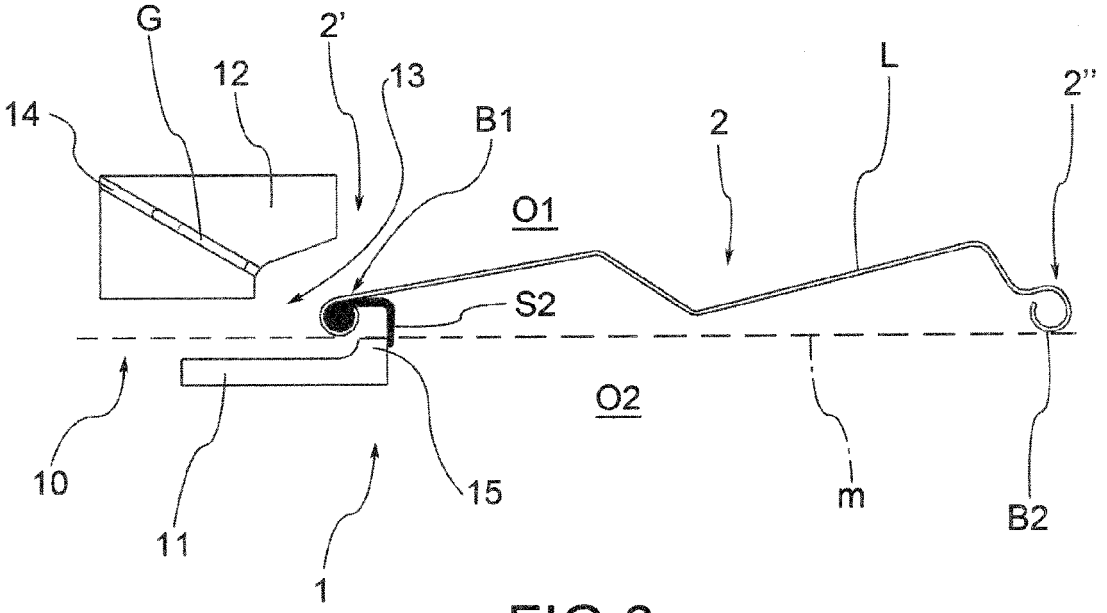
B1
O1
O2
S2
B2
15
m
11
1

FIG.5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B1
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O1
S2
O2
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15
m
B2
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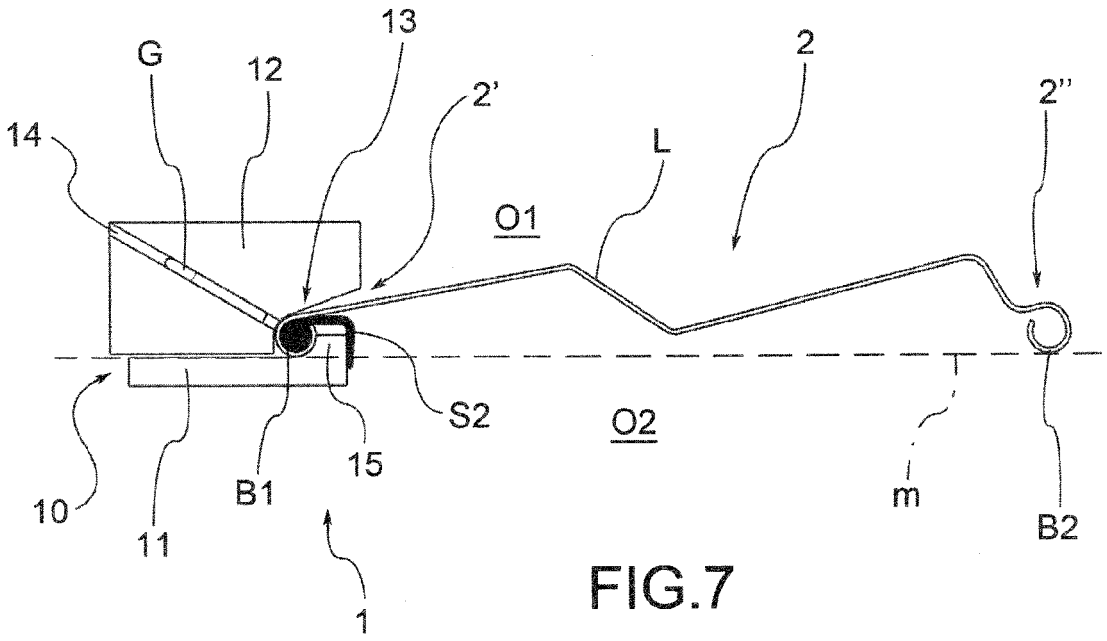
FIG.6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2''
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L
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S2
O2
15
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B1
m
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B2
1

FIG.7

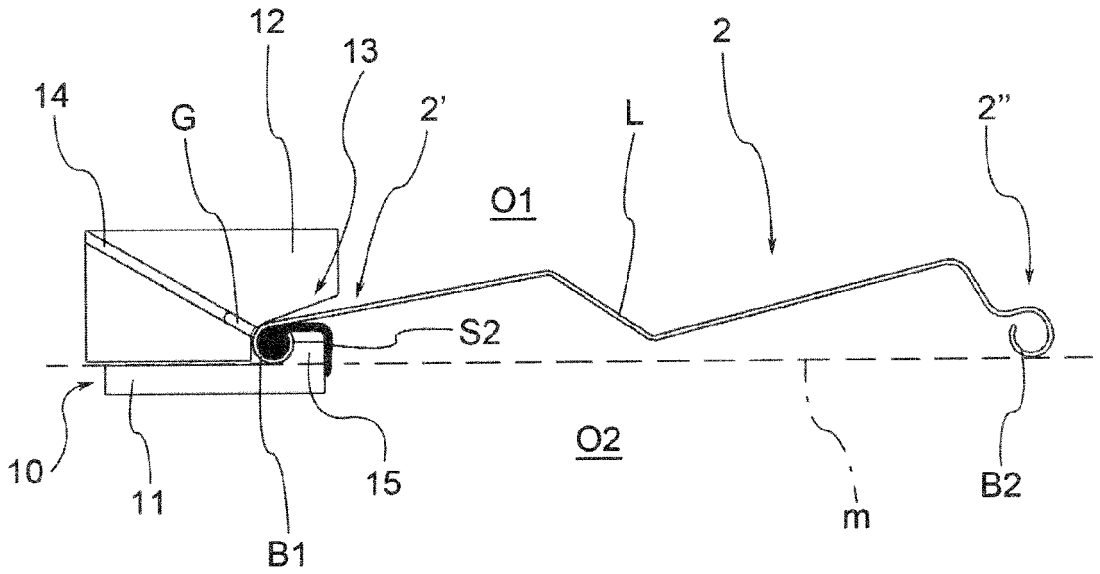
12
13
2
14
G
2'
L
2''
O1
S2
10
15
O2
11
m
B2
B1

FIG.8

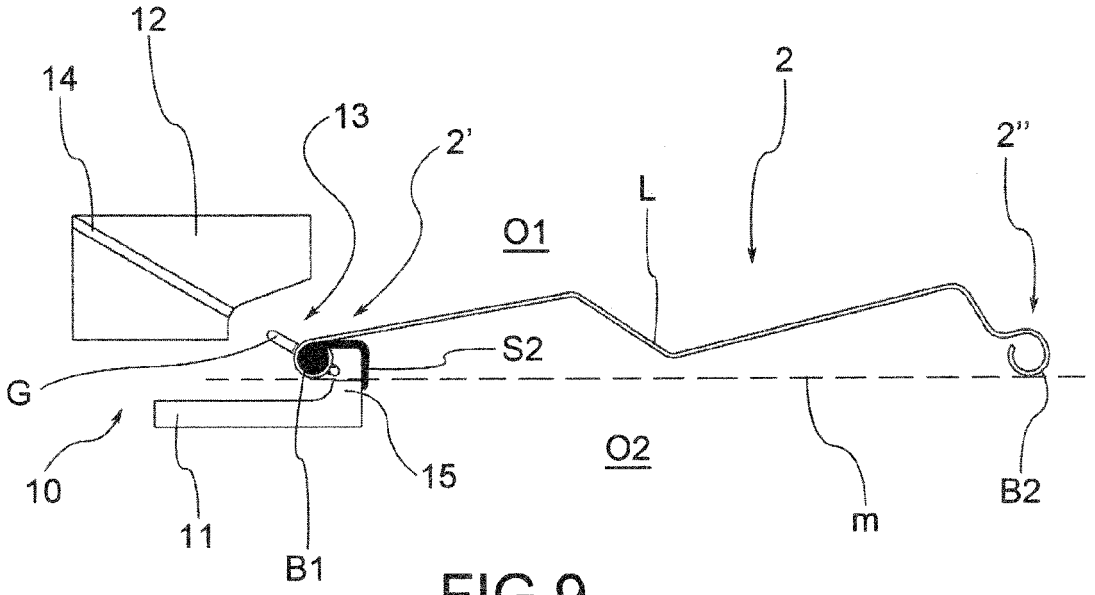
12
14
13
2'
2
2''
L
O1
S2
G
10
11
B1
15
O2
m
B2

FIG.9

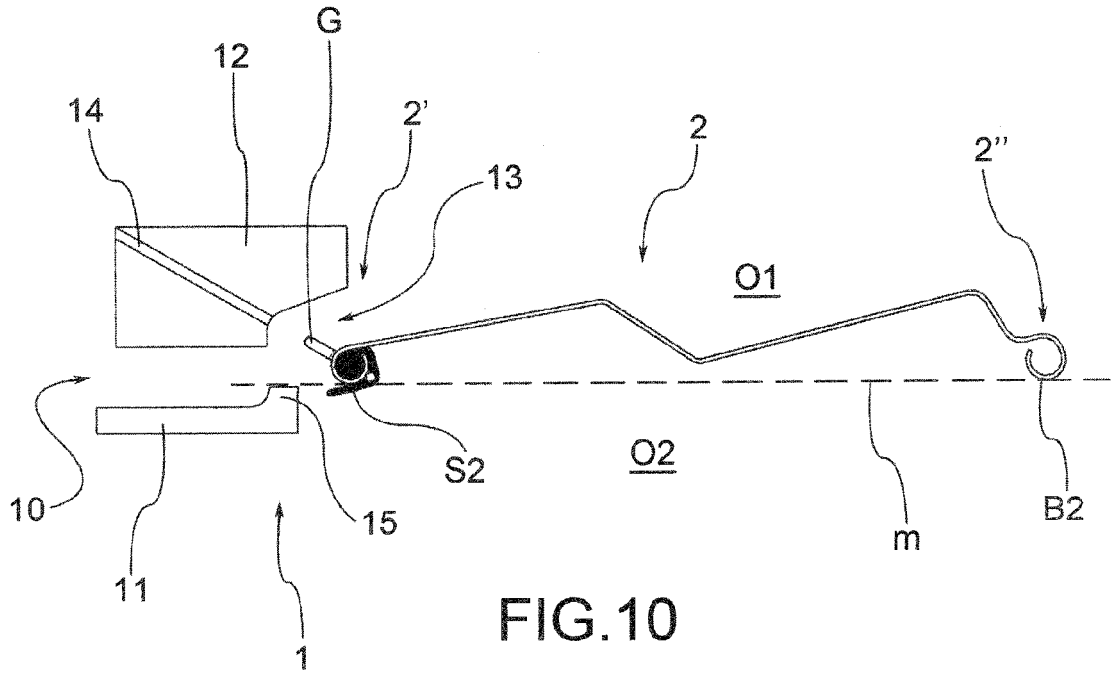
G
12
14
2'
2
2''
13
O1
10
S2
O2
15
m
B2
11
1

FIG.10

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 3998

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The present search report has been drawn up for all claims

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Munich	23 April 2015	Cornu, Olivier

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