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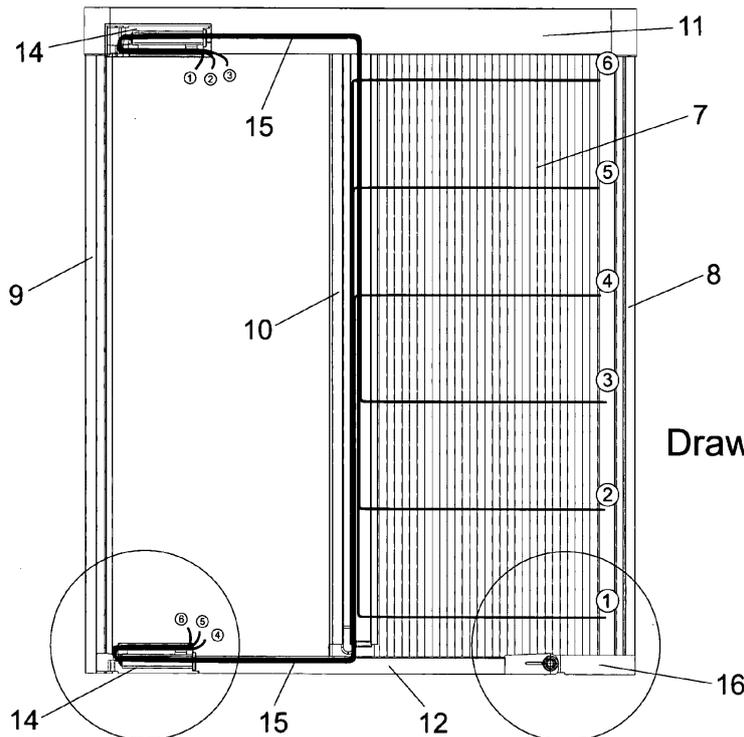
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**(54) Pivotal floor guiding profile for a horizontally sliding mosquito net**

(57) The invention is a horizontal guide system for anti-mosquito systems with plisse net (pleated), moving horizontally. The horizontal guide system consists of a straight part (12) which carries an articulation mechanism (16) on its one end and on the other one a counter-terminal accessory (14), which stabilizes the upper unified

bundle of ropes (4, 5, 6). The straight part (12) of the guide enters sliding into the articulation mechanism (16) with its one end, and stabilizes there in suitable sockets (29) and with its other end enters sliding into the back part of the counter-terminal accessory (14) and stabilizes there in suitable sockets (30).



**Drawing 1**

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## Description

**[0001]** The invention belongs to the field of mechanics with regard to anti-mosquito net systems that are used for horizontal door sliding.

**[0002]** According to the current state of the art, those systems mainly use pleated mosquito net (screen) which is plisse, so it can be fold and unfold. The present invention refers to anti-mosquito systems with such plisse net (pleated).

These systems are like a frame, which has as its vertical sides two boxes, the restraint and the sliding one. The restraint box is screwed and fixed on one of the vertical door frames, while one lateral fixed rail is screwed and fixed on the opposite vertical door frame. The sliding box is moving from the restraint box towards the fixed lateral guide and backwards, always in a parallel position to these two accessories. The pleated net is folded into its pleats (plisse), between the two vertical boxes, the fixed restraint box and the moving sliding one.

The frame has two fixed guides, the upper and the lower, as its two horizontal sides, screwed on the upper and the lower opening of the door frame, respectively. The sliding box moves sliding into these two horizontal guides, the upper and the lower, which, according to the current state of art, are made of aluminum, shape reverse II and with lateral walls height approximately 4mm.

**[0003]** The system works in the following way: as the user pulls the sliding box and directs it towards the fixed lateral guide, which is screwed on the opposite vertical door frame, the pleated net is simultaneously unfolded. By doing the opposite movement, which means directing the sliding box back to its initial position next to the restraint box, the pleated net is simultaneously folded back into its pleats and the net is drawn back. During the above mentioned action the pleated net folds and unfolds in its pleats, supported by short ropes which cross it over horizontally, longwise. The short ropes, placed horizontally and in equal distances from each other, work in order to stretch, when unfolded, and in that way they keep the pleated net stretched and unfolded in its position. They are also useful for its refolding in its pleats. One end of every rope is fixed on the restraint box, which is firmly screwed on the door frame, whereas the other end of every rope crosses the moving sliding box, then the horizontal guide (upper or lower) and fixes on the fixed vertical guide as a bundle of ropes, as described below. When the user pulls the sliding box and directs it towards the vertical lateral guide, the pleated set is pulled along and is unfolded. Along with the net the short ropes are also unfolded and keep the net straight in its place. When the user moves the sliding box the opposite way and returns it towards the restraint box, the pleated net is folded and along with the net the short ropes are also drawn back.

The short ropes unify in two rope groups of equal number, the upper and the lower group:

The short ropes crossing the middle of the upper part of the net form the upper group. The ends of the ropes cross horizontally over the net and then unify in one bundle, which comes down vertically through the sliding box towards the lower horizontal guide, comes through it longwise and fixes on the lower end of the fixed lateral guide. Consequently, the upper rope group ends up at the lower part.

The short ropes crossing the middle of the lower part of the net form the lower group. The ends of the ropes cross horizontally over the net and then unify in one bundle, which comes up vertically through the sliding box towards the upper horizontal guide, comes through it longwise and fixes on the upper end of the lateral fixed guide. Consequently, the lower group ends up at the upper part.

To sum up, the short ropes are divided in two groups of equal number of ropes, the upper rope group directs downwards and ends up being a unified bundle at the lower end of the fixed lateral guide, whereas the lower rope group directs upwards and ends up being a unified bundle at the upper point of the fixed lateral guide.

**[0004]** The technical problem occurring in all the anti-mosquito systems with a pleated net, is the fixed position of the lower horizontal guide in order for the ropes to function.

To be precise, the fixed lower horizontal guide always creates problems to the users' free passage, which have to watch out so that they won't stumble upon it.

Another technical problem is that the users' passage above the guide may result in cutting the unified bundle, which crosses the lower guide, inside it and longwise.

Another technical problem is that, due to the fact that the guide is firmly fixed and screwed on the floor, rainwater enters it quite often, and is trapped inside it. As a result the unified bundle of the upper rope group, crossing it, rots.

Another technical problem occurring, is the accumulation of dust and garbage inside the guide, which, by folding and unfolding the net, are drifted and enter the internal part of the net. The final result of the above mentioned technical problems is that the net blocks, the sliding guide cannot move and unfold it, which consequently requires the replacement of the entire anti-mosquito system, since the replacement of the net alone is not an available option.

All the above mentioned problems occur from the fact that inside and longwise the lower horizontal guide passes the unified bundle of ropes, which afterwards continues its course, comes out of the lower horizontal guide and fixes on the lower part of the fixed lateral guide. In that way, the lower horizontal guide cannot be moved, since the bundle of ropes crosses it and continues its course out of it.

**[0005]** These technical problems are intended to be solved in a different way, for example, in EP 2157274

A2, in EP 1653038 A1, in EP 0549209 A1, in EP 1959090 and in 0999335 A1.

**[0006]** The present invention solves the above mentioned technical problems, because it consists of a horizontal guide system, which is not firmly screwed on the floor and thanks to its articulation mechanism it can fold and rise up from the floor. At the same time, the unified bundle of ropes, which according to the current state of art crosses the lower guide and then comes out of it, and fixes on the lower end of the fixed lateral guide, in the present invention, does not come out of the guide, but instead terminates its course there and fixes on inside the guide, thanks to a special counter-terminal accessory, which stretches and stabilizes precisely the bundle of ropes inside the lower guide. Since the bundle of ropes fixes on the lower guide, the lower guide becomes autonomous from the fixed lateral guide and consequently it is now possible to rise up from the floor.

By giving the lower horizontal guide movement independence and in particular the capability to fold and rise up from the floor, the invention solves the above mentioned technical problems. In that way, the user does not face the danger of stumbling upon the guide any more. Moreover, rainwater does not puddle in the guide and dust and garbage do not accumulate in its walls, since the guide rises up and can get cleaned easily, as well as the floor. The user can keep the guide risen up or folded for as long as he/she wants, without letting it cause trouble to the passage through, especially during the winter months, when the insects, for which the net is necessary, do not exist.

Finally, the capability of the lower guide to fold and rise up from the floor also solves the technical problem of the possible cut of the lower unified bundle of ropes, caused by the constant users' passage above the lower horizontal guide.

The result of the above mentioned and the main advantage of the present invention is that the life expectancy of the product is extended, i.e. the anti-mosquito net system, since by cleaning the lower horizontal guide, the anti-mosquito net and the short ropes crossing it stay in excellent condition.

**[0007]** The upper horizontal guide does not present the problems of the lower horizontal guide, as mentioned above, since neither rainwater nor garbage can enter the upper fixed horizontal guide, nor is it possible that the upper unified bundle can get cut by the users' passage. However, the present invention can also be applied, in order to replace the upper horizontal guide in the exact same way it replaces the lower one.

**[0008]** The Drawings accompanying the invention illustrate, in brief, the following:

Drawing 1 depicts the system of the pleated net in oblique view, with the net partially unfolded, and the lower guide, which carries the articulation mechanism on its one end and on its other one the counter-terminal accessory, and the upper guide with the

counter-terminal accessory.

Drawing 2 depicts the system of the pleated net in oblique view, with the net fully folded and the lower guide with the articulation mechanism and the counter-terminal accessory, in three successive stages:

in the initial horizontal position of function of the system (figure 2a),  
in reclining position 45 degrees (figure 2b), and in reclining position 90 degrees, vertical (figure 2c),  
as well as the three positions of the articulation mechanism, in detail, as it moves according to the above mentioned, respectively.

Drawing 3 depicts the lower guide, disassembled in its parts, the articulation mechanism, the straight part of the guide and the counter-terminal accessory, in perspective (figure 3a) and in floor plan (figure 3b).

Drawing 4 depicts the lower guide, assembled with the articulation mechanism, the straight part of the guide and the counter-terminal accessory, in perspective (4a) and in floor plan (4b) alongside the detail of the cut A-A' in profile.

Drawing 5 depicts the counter-terminal accessory and the analysis of its individual accessories and the method of assembly, and in particular, the screw, the head of the transit of ropes, the main body of the counter with grading and slot longwise, the nut and the safety disassembled (figure 5a), the head of the transit of ropes screwed on the screw thread (figure 5b), the screw with the head of the transit of ropes stabilized inside the main body aimed by the safety, coming through the slot and located on the main body, longwise (figure 5c), the entire counter-terminal accessory fully assembled (figure 5d) and the counter-terminal accessory in function on the guide (figure 5e).

Drawing 6 depicts the stages of the counter-terminal accessory, for the stabilization of the bundle of ropes, and in particular

the starting position of stretching of the bundle of ropes from the head of the transit of ropes, in the initial point of the course of the main body of the counter (figure 6a),  
one middle position of stretching of the bundle of ropes from the head of the transit of ropes, approximately at the middle point of the course of the main body of the counter (figure 6b) and  
the final position of stretching of the bundle of ropes from the head of the transit of ropes, at the end of its course (figure 6c).

Drawing 7 depicts the counter-terminal accessory cut (figure 7a), and in perspective (figure 7b).

**[0009]** An example implementing the present invention follows with a detailed description and reference to the attached drawings.

**[0010]** As depicted in Drawing 1 the pleated net (7) moves between the restraint box (8) and the fixed lateral guide (9), leaded by the sliding box (10). Its movement takes place inside the upper horizontal guide (11) and the lower horizontal guide (12). Short ropes equal in length cross the pleated net (7) horizontally and in equal distances from each other, and are useful for the folding and the unfolding of the net. These ropes are divided in two groups: the lower group with three short ropes (1, 2, 3) and the upper group with ropes equal in number (4, 5, 6). In the present example the two groups have ropes equal in number. However, in another implementation of the present inventive idea, it is possible that the two groups of ropes may not be equal in number, but all of them should always cross the net horizontally.

**[0011]** As depicted in Drawing 1, the three ropes of the lower group (1, 2, 3) begin their course from the lower part of the net, cross the net (7) horizontally and then unify in a bundle (15) which is led vertically upwards through the sliding box (10), then crosses the upper horizontal guide (11) longwise and fixes on the upper counter-terminal accessory (14).

**[0012]** Similarly, the three ropes of the upper group (4, 5, 6) begin their course from the upper part of the net, cross the net (7) horizontally and then unify in a bundle (15) which is led vertically downwards through the sliding box (10), then crosses the lower horizontal guide (12) longwise and fixes on the counter-terminal accessory (14).

The bundle may cross the lower horizontal guide (12) either through the internal part of its floor in the middle and longwise, or through the internal part of its lateral wall from the side on which the counter-terminal accessory is located (14).

**[0013]** As depicted in Drawings 2, 3 and 4 the system of the horizontal guide consists of the following: the straight part of the guide (12) enters with its one end sliding into the back part of the counter-terminal accessory (14), while with the other end of the straight part of the guide (12) it enters sliding into the articulation mechanism (16).

The articulation mechanism (16, Drawing 3) consists of two horizontal parts (17 and 18) unified through articulation (20) and a third part (19) vertical to the second part (18). The straight part of the guide (12) enters with its one end sliding into one horizontal part (17) of the articulation mechanism (16), and stabilizes there in suitable sockets (29). Inside the other horizontal part (18) the folded net (7) and the sliding box (10), which leads and folds the net, are gathered. (Drawing 2). The third part (19) of the articulation mechanism (16, Drawing 3), which is vertical to the second part (18), enters the restraint box (8)

and stabilizes it on the vertical door frame (figures 2a, 2b, 2c, 3a, 3b, 3c).

With its other end, the straight part of the guide (12) enters sliding into the counter-terminal accessory (14) and also stabilizes there in suitable sockets (30).

As depicted in Drawings 5 and 6, the counter-terminal accessory (14) consists of a screw thread (21) carrying a head (26) and of a head of the transit of ropes (22), which also carries a thread in its internal part and a projection with bright opening (32) at its upper part. The shape of the head of the transit of the ropes (22) corresponds to that of the internal bright chamber (31), in order to enter sliding into it.

The counter-terminal accessory (14) also consists of a main body (23) with a bright chamber (31) internally, with a slot (28) at the upper part of the bright chamber and with grading (27) externally, longwise the slot and also of a nut (24) and a safety (25) (figure 5a).

The screw thread (21, figure 5b) is longer than the length of the main body (23). The screw (21) enters and screws inside the internal thread of the head of the transit of ropes (22), and then enters, as an entire accessory, the bright chamber (31) of the main body (23), through the slot (28), so that the projection with the bright opening (32) shall be located and move outside the main body (23) and longwise the slot (28) until its end. When the projection with the bright opening (32) is at the end of the slot (28), the end of the screw thread (21) projects out of the main body (23). It stabilizes in this position thanks to the nut (24) and the safety (25). At the same time, the head (26) of the screw (21) stays out of the chamber (31) and projects from the other end of the main body (23) (figures 5c and 5d).

As the screw thread (21) rotates, the head of the transit of ropes (22) screws on the screw thread (21) and moves longwise the slot (28) of the main body (23). As a result, the head (26) moves longwise the main body (23). The reverse movement of the screw (21) breeds the movement of the slot (28) towards the opposite direction.

The bundle of ropes (15) comes through the bright opening (32) of the head of the transit of ropes (22) projection, and ties up in a knot.

As depicted in Drawings 6 and 7, the head (26) of the screw rotates reversely as to the direction it has been screwed on the head of transit (22) and thanks to the safety (25), the screw thread (21) stabilizes and rotates inside the bright chamber (31), while simultaneously the head (22) screws on the upper screw thread (21) and moves longwise the slot (28) of the main body (23) directing towards the head (26) of the screw. This movement results in the stretching of the bundle (15) of ropes and enables the folding and unfolding of the net (7). Afterwards, the exact same procedure follows, with the counter-terminal accessory (14) located on the upper horizontal guide (11) (figure 1).

The external grading (27) located at the bright chamber (31) of the main body (23) longwise the slot (28), helps the unified bundle (13), which directs vertically down-

wards, and the unified bundle (15) which directs vertically upwards, to be similarly stretched by the counter-terminal accessory (14). When this happens, and the two bundles of ropes (13, 15) are stretched to the terminals (14) in the same grading, then the sliding box (10) shall be at a vertical position and shall move in a parallel position to the lateral guide (9) and the restraint box (8) (figure 1), reaching, in that way, the optimum function of the system.

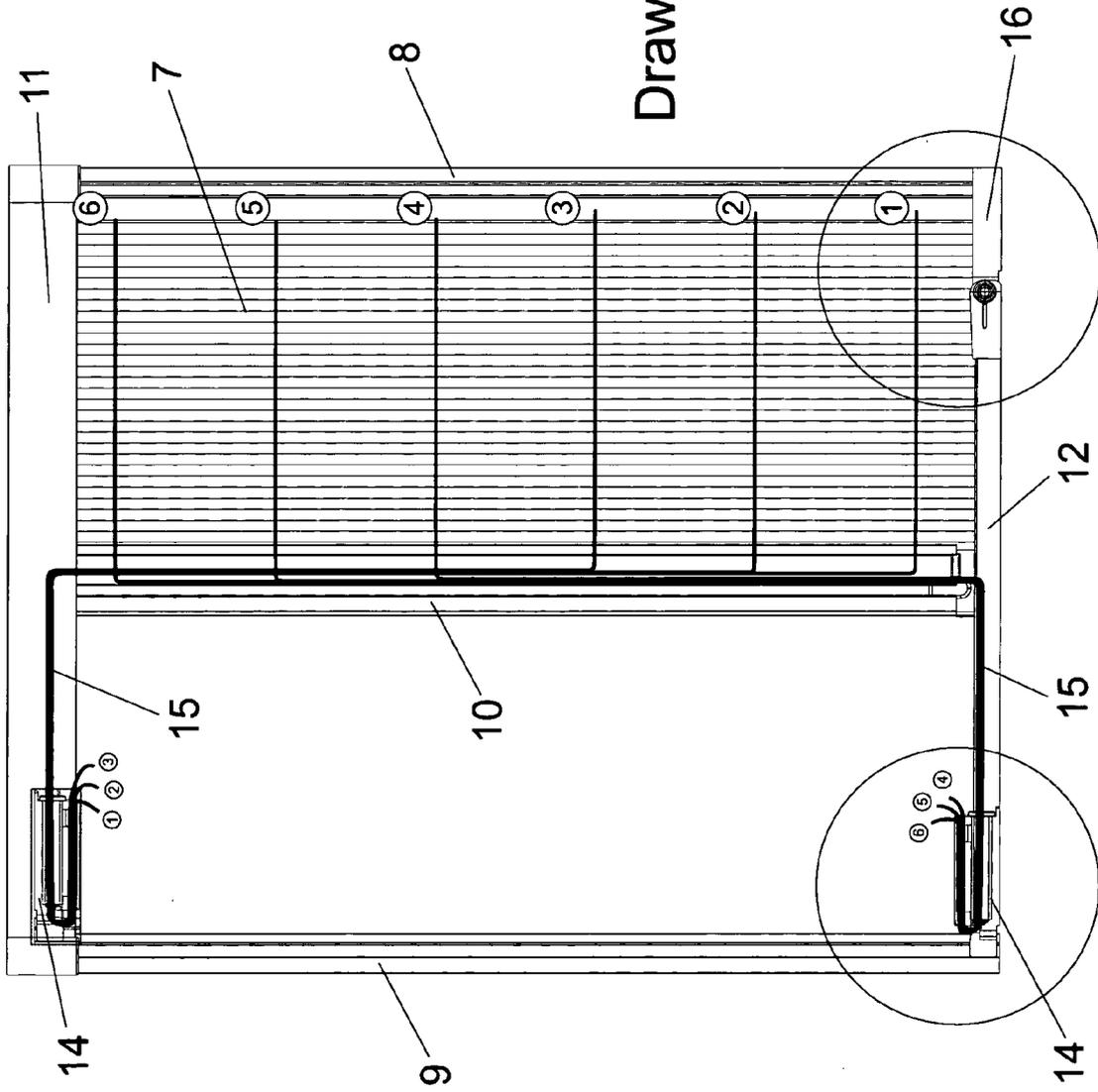
**[0014]** In the implementation example of the present invention mentioned above, there is a counter-terminal accessory (14) at the lower (12) as well as at the upper horizontal guide (11). However, the entire anti-mosquito system can function in the same way even if the counter-terminal accessory (14) and the articulation mechanism (16) are located at the straight part of the lower guide (12) alone, while the upper guide (11) does not carry the counter-terminal accessory, described in the present invention, but the bundle of ropes (15), coming through it, ties up on the fixed lateral vertical guide (9), as it already happens according to the current state of art. The reason is that, the reclining function is not necessary at the upper horizontal guide (11), since it does not present the technical problems observed at the lower one, as mentioned above.

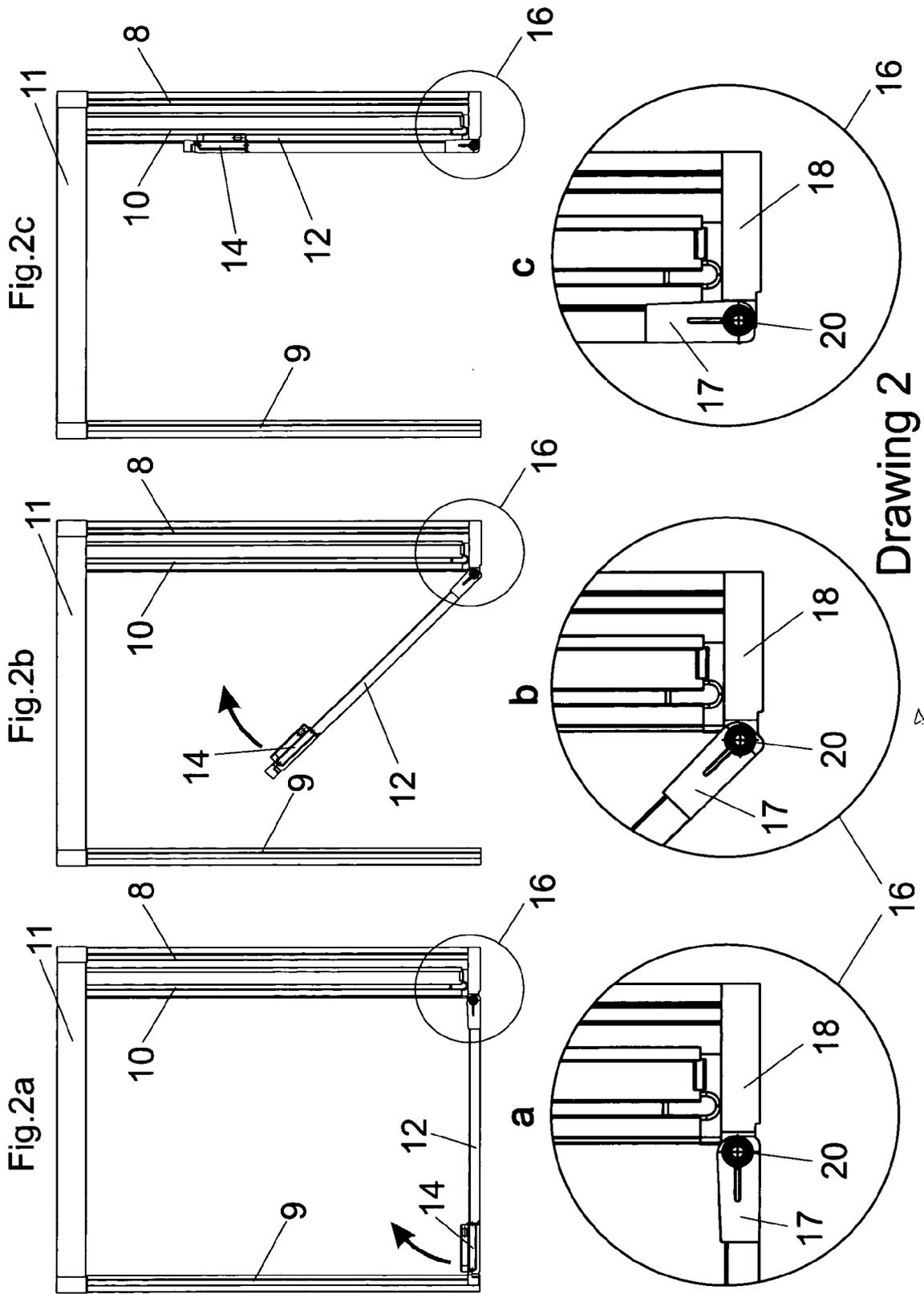
**[0015]** The present invention applies to the anti-mosquito systems with plisse net (pleated), moving horizontally.

## Claims

1. Anti-mosquito horizontal guide system, **characterized by** the fact that it consists of the straight part (12) of the guide, carrying an articulation mechanism (16) on its one end and on the other one a counter-terminal accessory (14) which stabilizes the upper unified bundle of ropes (4, 5, 6).
2. Anti-mosquito horizontal guide system, according to claim 1, **characterized by** the fact that the articulation mechanism (16) consists of two horizontal parts (17, 18) unified through articulation (20) and of a third part (19) vertical to the second part (18).
3. Anti-mosquito horizontal guide system, according to claims 1 and 2, **characterized by** the fact that the straight part (12) of the guide enters sliding into the first horizontal part (17) of the articulation mechanism (16) with its one end point, and stabilizes there in suitable sockets (29).
4. Anti-mosquito horizontal guide system, according to claims 1 to 3, **characterized by** the fact that the third part (19) of the articulation mechanism (16) which is vertical to its second part (18), enters the restraint box (8) and stabilizes it on the vertical door frame.
5. Anti-mosquito horizontal guide system, according to claims 1 and 3, **characterized by** the fact that the straight part (12) of the guide enters sliding into the back part of the counter-terminal accessory (14) with its other end point and stabilizes there in suitable sockets (30).
6. Anti-mosquito horizontal guide system, according to claims 1, 3 and 5, **characterized by** the fact that the counter-terminal accessory (14) consists of:
  - a) main body (23) with bright chamber (31) internally, with slot (28) externally and longwise the body (23), and with grading (27) externally, longwise the slot (28)
  - b) screw thread (21) with head (26), which is longer than the length of the main body (23)
  - c) head of the transit of ropes (22) with projection with a bright opening (32) at its upper part through which the bundle of ropes (15) comes and ties up in a knot, and a thread in its internal part, in which enters and screws the screw (21) and by the fact that as the head (26) of the screw (21) rotates, the projection (32) of the head (22) constantly meets resistance on the slot (28) of the body and in that way the head (22) moves longwise the body (23).
7. Anti-mosquito horizontal guide system, according to claims 1, 5 and 6, **characterized by** the fact that the screw thread (21) enters the main body (23) of the counter-terminal (14) and its end fixes on the other end of the counter (14) thanks to the safety (25) and the nut (24).
8. Anti-mosquito horizontal guide system, according to claims 1, 5, 6 and 7, **characterized by** the fact that the shape of the head of the transit of ropes (22) corresponds to the shape of the internal part of the bright chamber (31), so that it can enter sliding into it.

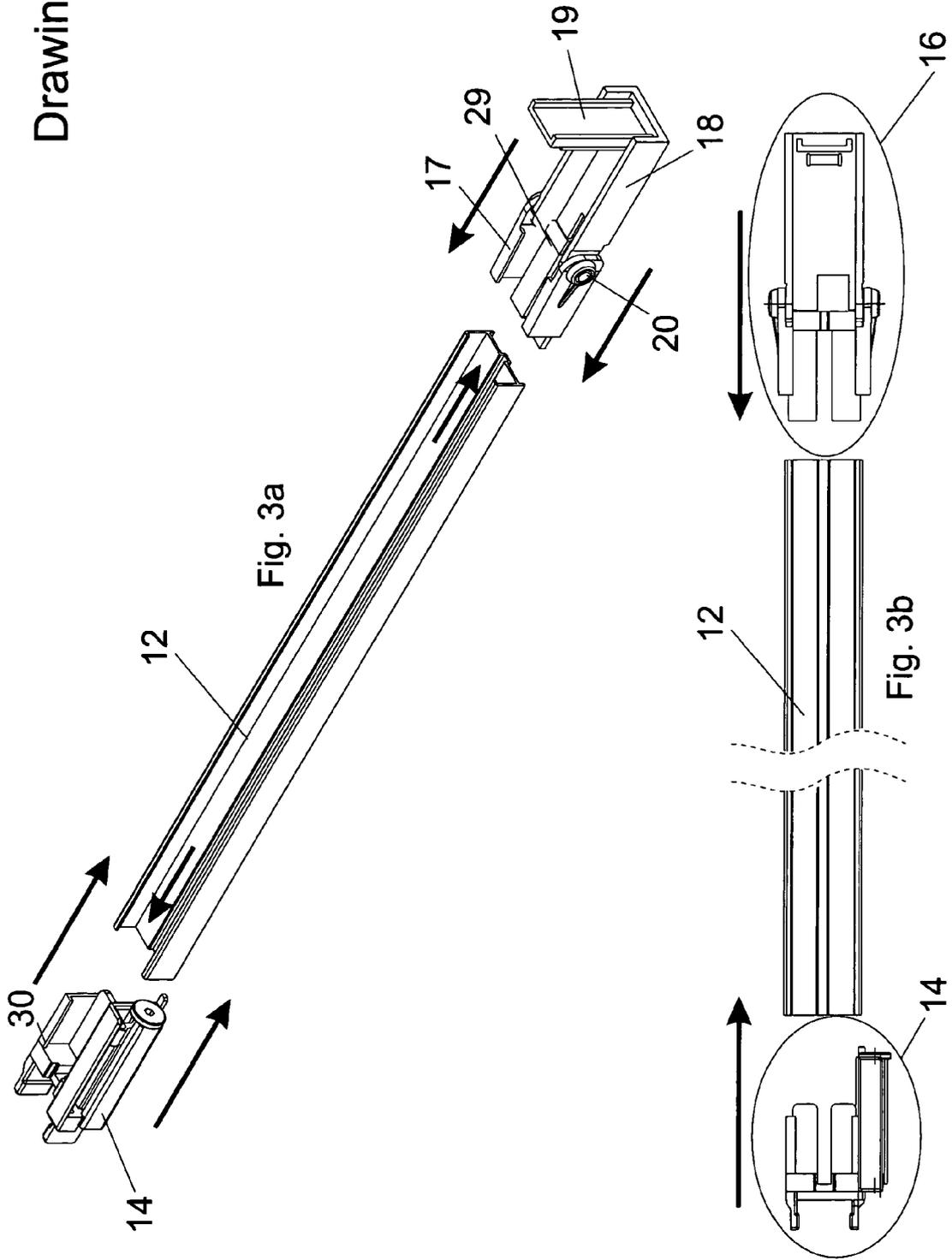
Drawing 1



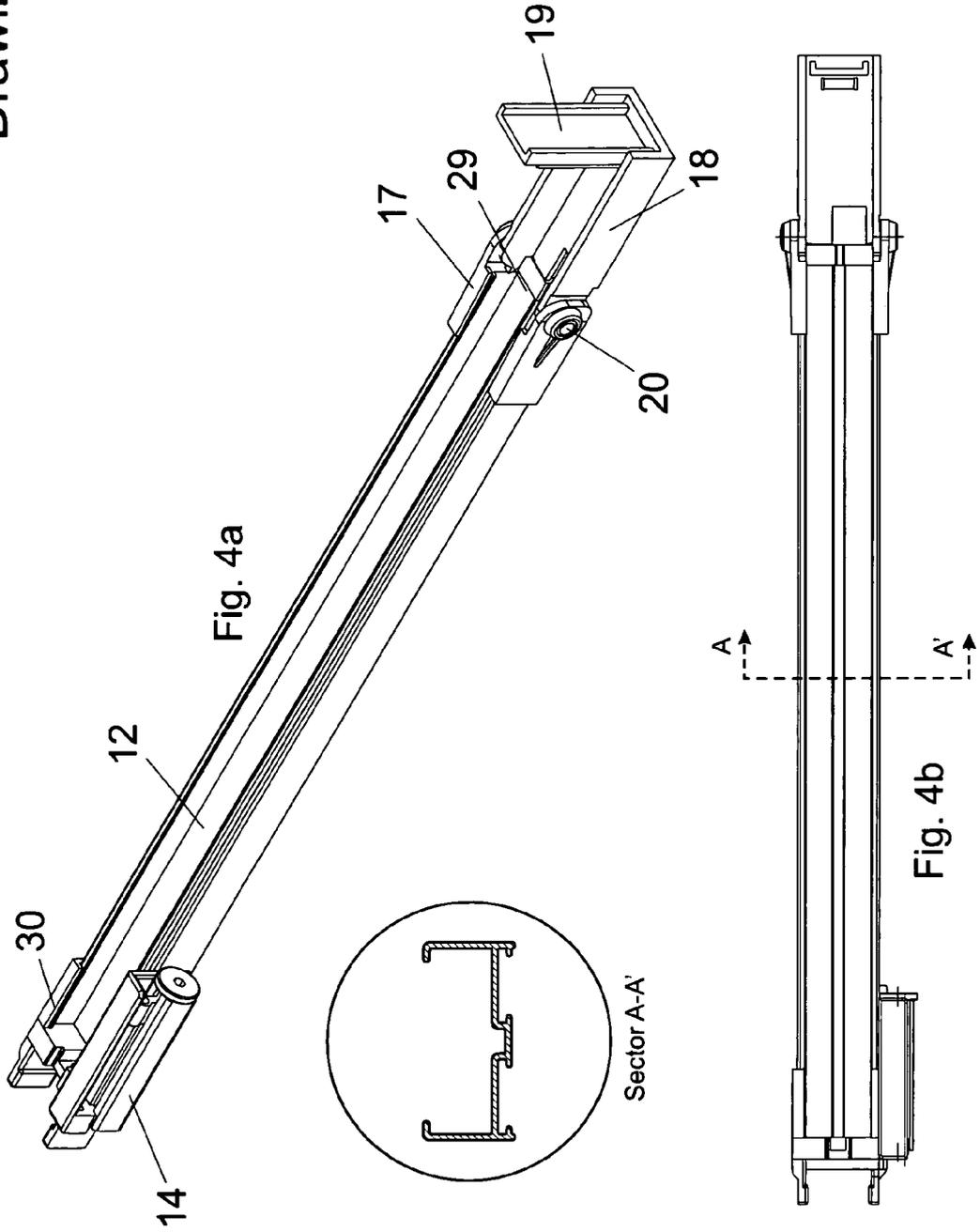


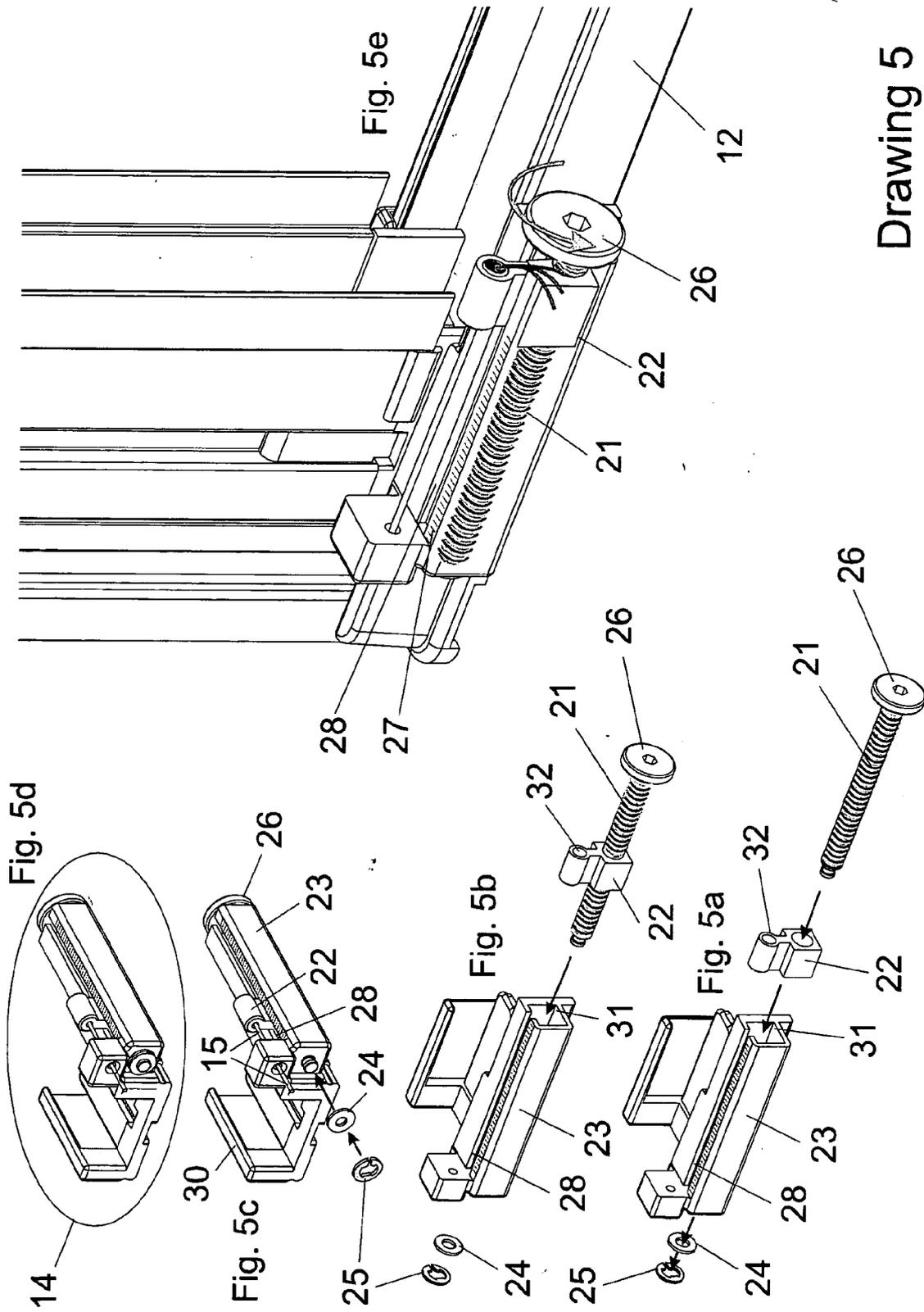
Drawing 2

Drawing 3

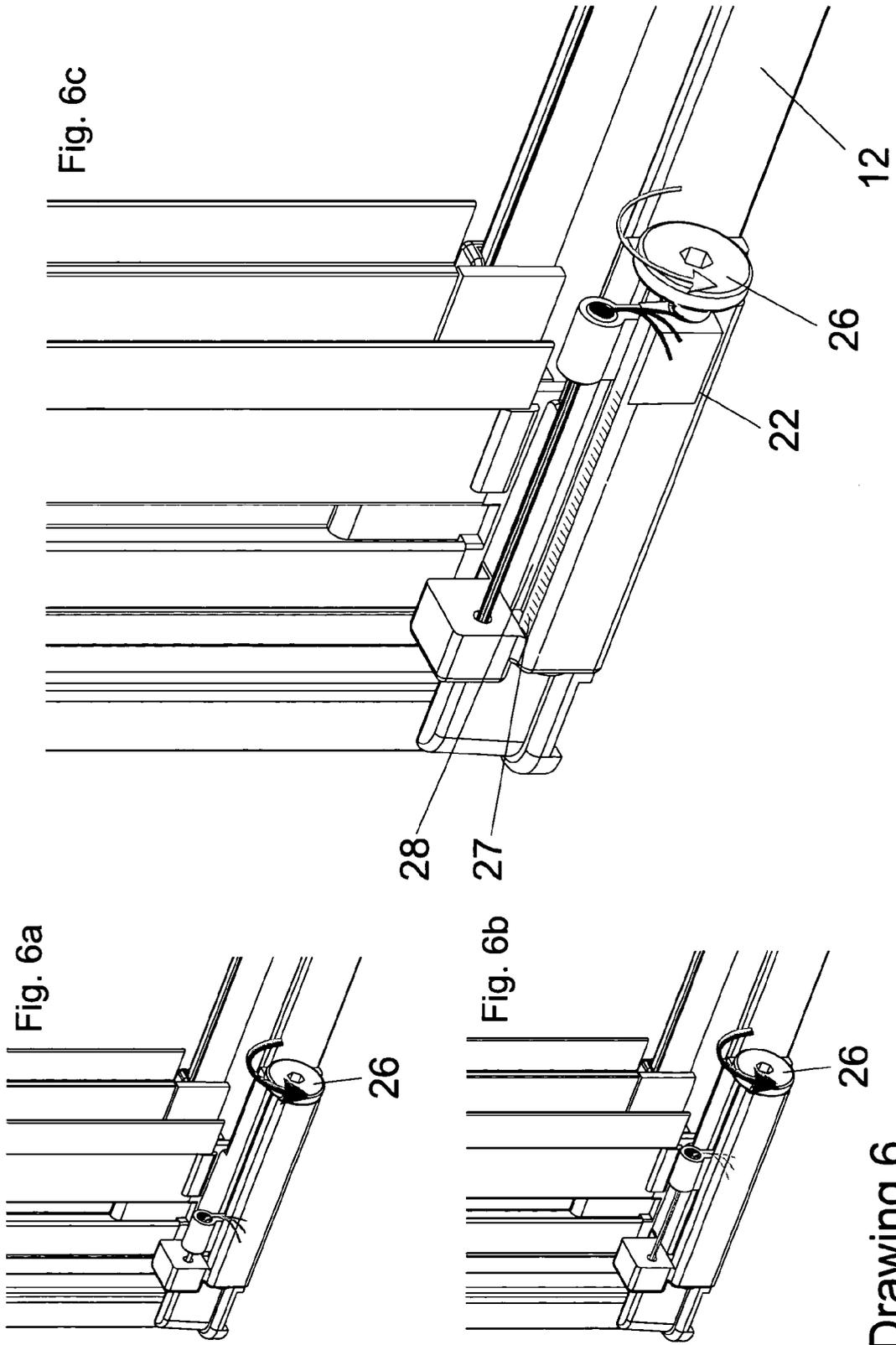


Drawing 4

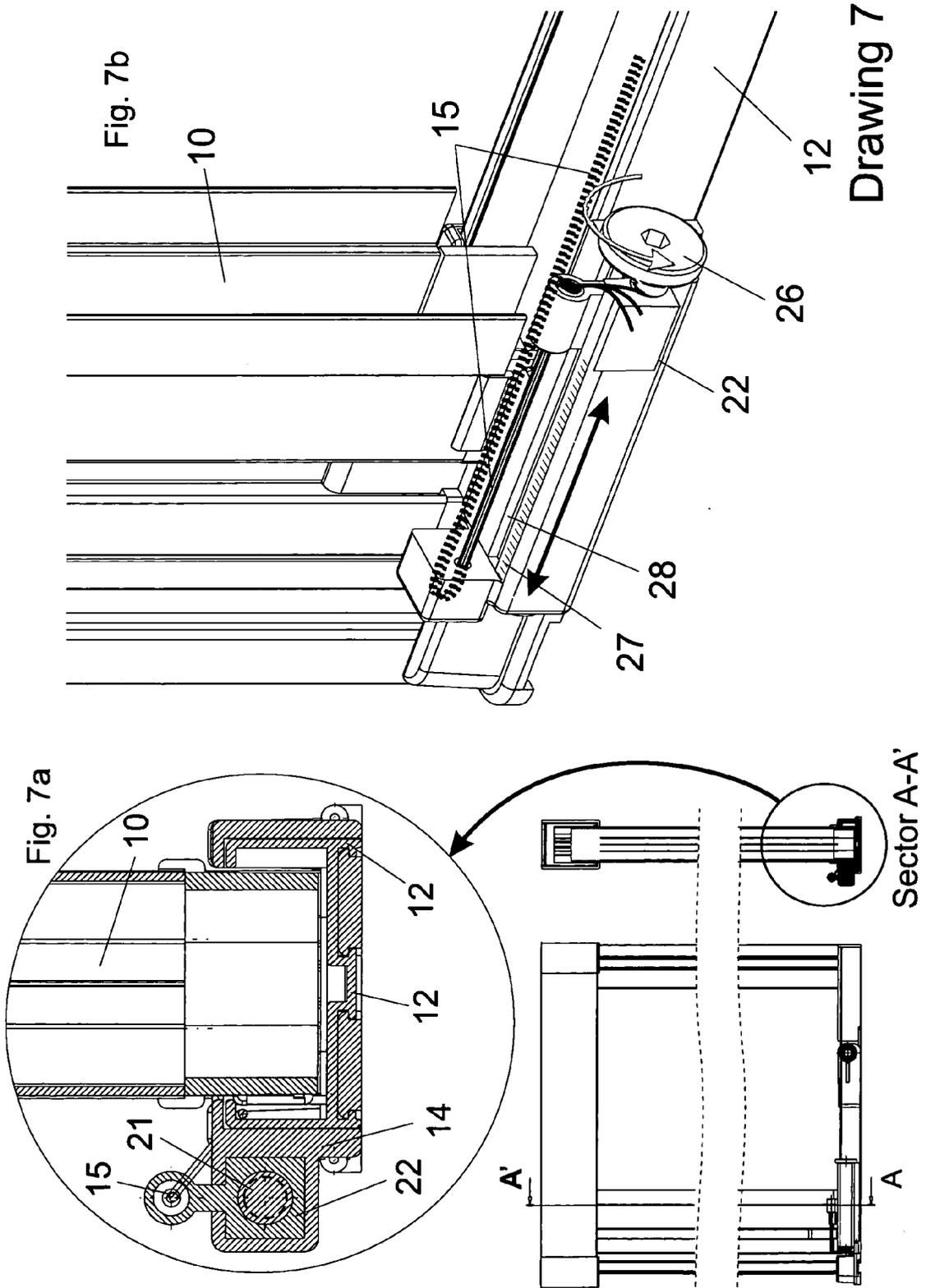




Drawing 5



Drawing 6



Drawing 7



EUROPEAN SEARCH REPORT

Application Number  
EP 11 38 6023

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 May 2012	Examiner Schwertfeger, C
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