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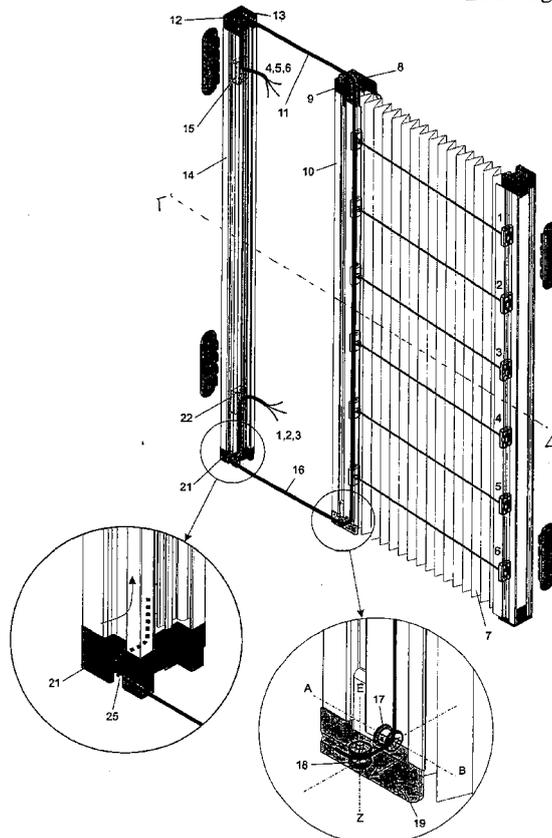
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(54) Rope guidance in a horizontally sliding mosquito net

(57) The invention is a rope movement system for anti-mosquito pleated net (7), moving horizontally. It consists of a terminal accessory (19) at the lower end of the sliding guide (10), carrying a transit pulley (17), a direction pulley (18) and a sliding pulley (23), as well as a terminal accessory (21) at the lower end of the fixed lateral guide

(14), carrying a lateral entrance socket (25) of the unified bundle (16) formed by the short ropes crossing over the net (7). The invention applies to the existent anti-mosquito systems by replacing the accessory located at the lower end of the sliding guide (10) and the accessory located at the lower end of the lateral fixed guide (14).

Drawing 2



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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 use two examples of mosquito net. The stretched net that is rolled and unrolled and the pleated (plisse) net that is folded and unfolded.

[0003] The present invention refers to anti-mosquito systems with a plisse (pleated) net.

[0004] In these anti-mosquito systems the pleated net is folded in its pleats (plisse), in between two vertical boxes, the restraint and the sliding one. The entire system is like a frame that has the restraint and the sliding boxes as its vertical sides. The restraint box is screwed on one of the two vertical door frames, while one lateral fixed rail is screwed on the opposite vertical door frame. The sliding box moves between the restraint box and the lateral fixed rail, in a position parallel to them. The frame has two screwed and fixed guides, as its horizontal sides at the upper and the lower door opening, respectively. The sliding box slides into the two horizontal guides, the upper and the lower made from aluminum, shape II and lateral walls height 4mm.

[0005] In that way the net is folded and unfolded. As the user pulls the sliding box, in order to unfold the anti-mosquito net, the pleated net is unfolded simultaneously. By doing the opposite move, bringing the sliding box back to its folded position, the pleated net is folded too.

[0006] During the above-mentioned action, the pleated net is folded and unfolded 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, when unfolded are stretched and then they are useful in keeping the pleated net straight in its position. They are also useful for its refolding in its pleats. One of the ends of each rope is fixed on the restraint box, which is screwed on the door frame, whereas the other end of the ropes passes through the moving sliding box. From this point on, the short ropes unify to rope groups of equal number, the upper and the lower group:

The short ropes passing through the middle of the upper part of the net, form the upper group. The ends of the ropes passing through the sliding box and then unify in one bundle, which passes through the lower horizontal fixed guide and ends up fixed on the lower end of the box of the lateral fixed guide.

[0007] The short ropes passing through the middle of the lower part of the net, form the lower group. The ends of the ropes passing through the sliding box and then unify in one bundle, which passes through the upper horizontal fixed guide and ends up fixed on the upper end of the box of the lateral fixed guide.

[0008] At this point occurs the following technical prob-

lem, regarding the upper group ropes, which form unified bundle of ropes, passing through the lower horizontal guide. This bundle passes through the lower horizontal guide, coming in touch with the floor of the guide and the straight way passing inside it, which means, in equal distance between its two lateral walls. This causes the following problem: the rainwater could enter the guide and as a consequence the short rope would rot. Furthermore, the short rope could get cut by the users' steps, while another problem is the accumulation of dust and garbage inside the guide, which, due to fact that the short rope gets in and out of the net, by unfolding the net the garbage could get into its internal part. The final result of the above mentioned 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.

[0009] Such technical problems exist, for example, in the EP 0549209 A1 and the EP 2157274 A2 products.

[0010] The lower group of ropes which passes through the upper fixed horizontal guide as a unified bundle, does not present the above mentioned problems of the lower part, since the rainwater cannot enter the upper fixed horizontal guide, neither exists the danger of garbage accumulation in the upper fixed horizontal guide, either the danger of the cut of the upper unified bundle by the user's steps.

[0011] The present invention is an anti-mosquito net rope movement system. It solves the above technical problems, since the lower bundle does not pass contiguously through the middle part of the lower horizontal guide longwise, like in the case of the current state of the art. In the present invention the lower bundle of ropes borders the internal lateral wall of the lower horizontal guide, longwise, and uses pulleys, which alter the course of the rope from the current state of the art. In that way, the bundle borders the lateral wall of the lower horizontal guide and the user cannot see it. As a consequence, the present invention solves the above technical problems, since the bundle of ropes is not exposed to the movement of the users' feet, and if rainwater enters the lower guide, the bundle is not in danger of rotting, since it doesn't border the floor of the guide, where the water enters. Furthermore, even if garbage and dust accumulate in the guide, the bundle does not get in touch with the garbage, and consequently does not transfer them inside the net. The result of the above mentioned and the main advantage of the present invention is that it solves the problem of the destruction of the anti-mosquito system by the reasons mentioned above.

[0012] The Drawings that accompany the invention illustrate, in brief, the following:

Drawing 1 pictures the anti-mosquito system with a pleated net in oblique view, with the net partially unfolded, and in detail, the lower point of the sliding guide and its movement pulley.

Drawing 2 pictures the pleated net, with the bundle of ropes at the lateral wall of the lower fixed horizontal guide. In detail, it presents the movement system of the bundles and in particular the lower end of the sliding guide with the two pulleys, the transit pulley and the direction pulley, and the lower part of the fixed lateral guide with the bundle of ropes entering it.

Drawing 3 pictures the anti-mosquito system with a pleated net, with the bundle at the lateral wall of the lower fixed horizontal guide entering and being fixed on inside the lower part of the fixed lateral guide. In detail, it presents one part of the rope movement system and of the anti-mosquito net and in particular, the lower end of the sliding guide with the direction pulley.

Drawing 4 pictures in detail one part of the rope movement system of the anti-mosquito net and the four transit phases of the transit of the bundle: towards the transit pulley (figure 4a), around the transit pulley (figure 4b), towards the direction pulley (figure 4c) and around the direction pulley (figure 4d) towards the lower point of the lateral guide.

Drawing 5 pictures the rope movement system of the anti-mosquito net with the position occupied by the bundle inside the lateral wall of the lower fixed horizontal guide, longwise.

[0013] An example implementing the present invention follows with a detailed description and reference to the attached drawings.

[0014] As depicted in drawings 1, 2, 3, 5 short ropes traverse the pleated net (7) horizontally and in equal distances from each other, which are useful for the folding and the unfolding of the net. These ropes are divided in two groups: the upper group with three short ropes (1, 2, 3) and the lower group with equal in number ropes (4, 5, 6). In the present example the two groups have ropes equal in number. In another implementation of the present inventive idea, it is possible that the two groups of rope may not be equal in number, but all of them will always be horizontal.

[0015] The ropes are fixed vice versa:

The three ropes of the lower group (4, 5, 6) traverse the net (7) horizontally and then unify in a bundle (11) which heads vertically towards the upper ones and comes through the pulley (8). The pulley (8) lies inside the terminal accessory (9) of the upper end, of the sliding guide (10). Hereupon, the bundle (11) enters the opening (12) located inside the terminal accessory (13) at the upper end of the fixed vertical lateral guide (14) and is fixed on a point (15) inside the lateral guide (14).

The axis A-B of the pulley (8) is vertical to the axis C-D direction of the net (7) (drawing 5).

Similarly, as depicted in drawings 1 to 5, the three short ropes from the upper group (1, 2, 3) traverse the net (7) horizontally and then unify in a bundle (16) which goes down vertically and comes around the transit pulley (17) (drawing 4, figures 4a and 4b) forming a 90 degree angle. Afterwards, the bundle (16) moves horizontally and rotates around the direction pulley (18) forming again a 90 degree angle (drawing 4, figures 4c and 4d). Both the transit (17) and the direction (18) pulleys are located in the terminal accessory (19) at the lower point of the sliding guide (10).

The A-B axis of the transit pulley (17) is parallel to the axis C-D direction of the net (7), while the E-F axis of the direction pulley is vertical to the C-D direction of the net (7) (drawing 2). In that way, the A-B axis of the transit pulley (17) is vertical to the E-F axis of the direction pulley (18).

The terminal accessory (19) at the lower point of the sliding guide (10) (drawing 1), also carries a sliding pulley (23).

[0016] As depicted in drawings 2, 4 and 5, due to the direction pulley (18), the bundle (16) coming through it, is far from the floor of the lower fixed horizontal guide (24) and comes, longwise, through the entire lower fixed horizontal guide (24), contiguous to the internal lateral wall of the guide (24), and without touching the internal floor of the fixed horizontal guide at any point, contrary to the current state of art, where the bundle touches constantly the internal floor of the lower fixed horizontal guide. This distance between the bundle (16) and the floor of the guide (24) exists due to the existence of the transit pulley (17) in combination with the direction pulley (18) and thanks to them the technical problem of the wear of the bundle (16) and consequently of the net (7) is solved.

[0017] The same course of the bundle can also come through with the existence of two openings, transit and direction, instead of pulleys, or with the existence of two fixed accessories, around which shall move the bundle (16). However, in this implementation example is depicted the use of pulleys, direction (18) and transit (17), because due to their shape and function they prevent the bundle of ropes (16) from wearing off and cutting.

[0018] Moreover, the bundle (16) after passing through the entire lower fixed horizontal guide (24) longwise, contiguous to its internal lateral wall, it reaches the terminal accessory (21), located at the lower point of the fixed lateral guide (14). There, the bundle (16) enters the internal part of the lateral wall, via specified lateral entrance socket (25) for the bundle (drawings 2, 3 and 5), included in the terminal accessory (21) at the lower end of the fixed vertical lateral guide (14), and fixes on a point (22) in the internal part of the lateral guide (14), located in the middle of the width of the lateral guide.

[0019] The invention applies to the existing anti-mosquito systems, by replacing two of the following acces-

series: the accessory located at the lower point of the sliding guide, according to the current state of art, is being replaced by the lower point accessory (19) of the present invention, which carries a transit pulley (17), a direction pulley (18) and a sliding pulley (23), when in the same time, at the fixed lateral guide (14) the lower point, used in the current state of art, is respectively replaced by the terminal accessory (21) carrying the specified lateral entrance socket (25) for the transit of the bundle (16).

[0020] The present invention applies to the anti-mosquito system with pleated net, moving horizontally.

(16) can rotate around fixed accessories or enter openings.

Claims

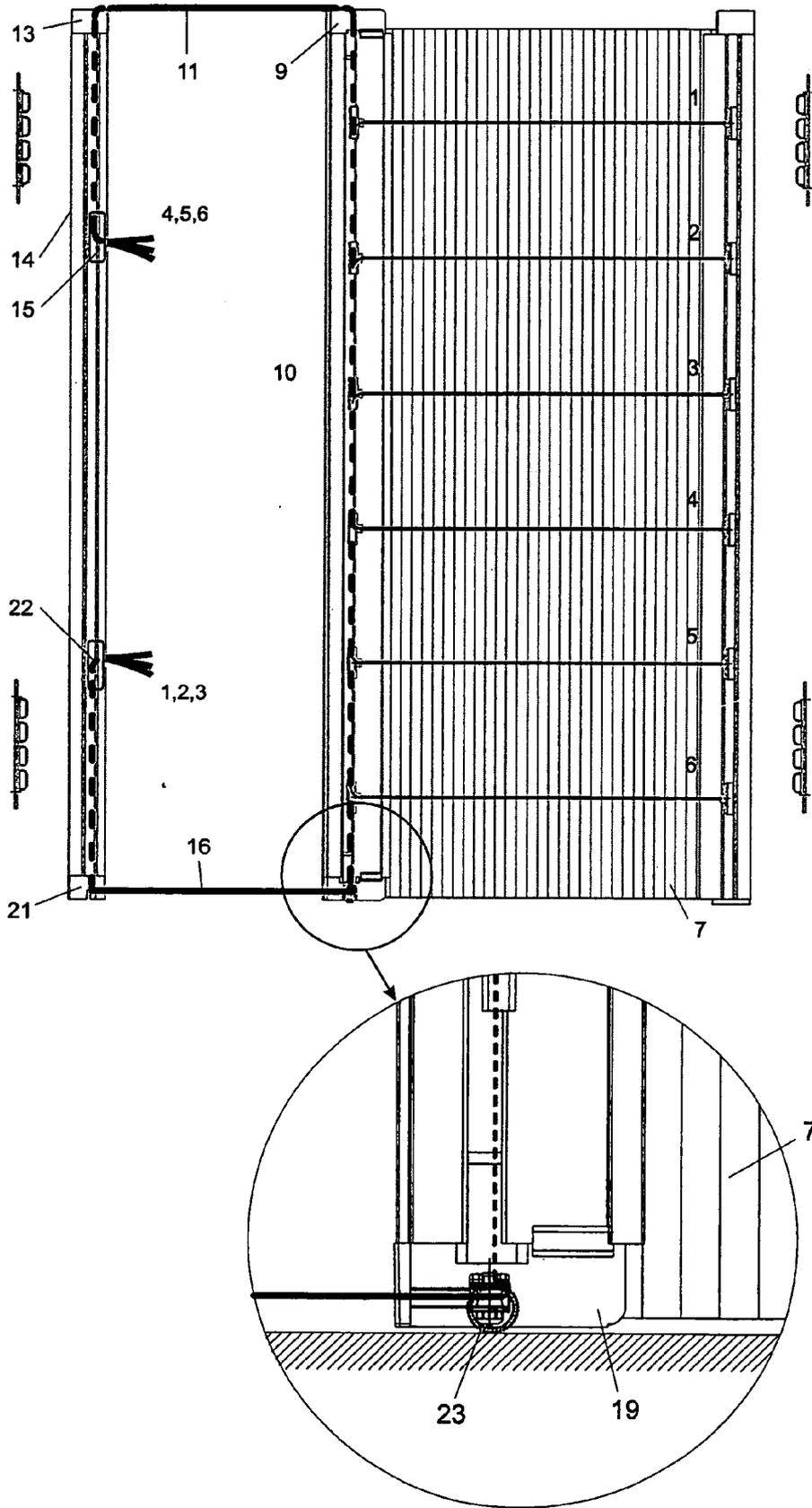
1. Anti-mosquito net rope movement system (7), **characterized by** the fact that it consists of:
 - A) terminal accessory (19) at the lower point of the sliding guide (10) carrying a transit pulley (17), a direction pulley (18) and a sliding pulley (23),
 - B) and terminal accessory (21) at the lower end of the fixed lateral guide (14) carrying a lateral entrance socket (25) of the unified bundle (16), formed by the short ropes (1, 2, 3) coming through the net (7).

2. Anti-mosquito net rope movement system (7) according to claim 1, **characterised by** the fact that the unified bundle (16)
 - A) heads down vertically and comes around the transit pulley (17) forming a 90 degree angle,
 - B) then moves horizontally and rotates around the direction pulley (18) forming a second 90 degree angle
 - C) comes over the entire lower fixed horizontal guide (24), longwise, contiguous to its internal lateral wall in equal distance from the internal floor of the guide (24)
 - D) and from the entrance socket (25) enters the terminal accessory (21) of the lower end of the fixed lateral guide (14) and fixes on a point (22) in the internal part of the guide (14) in the middle of its width.

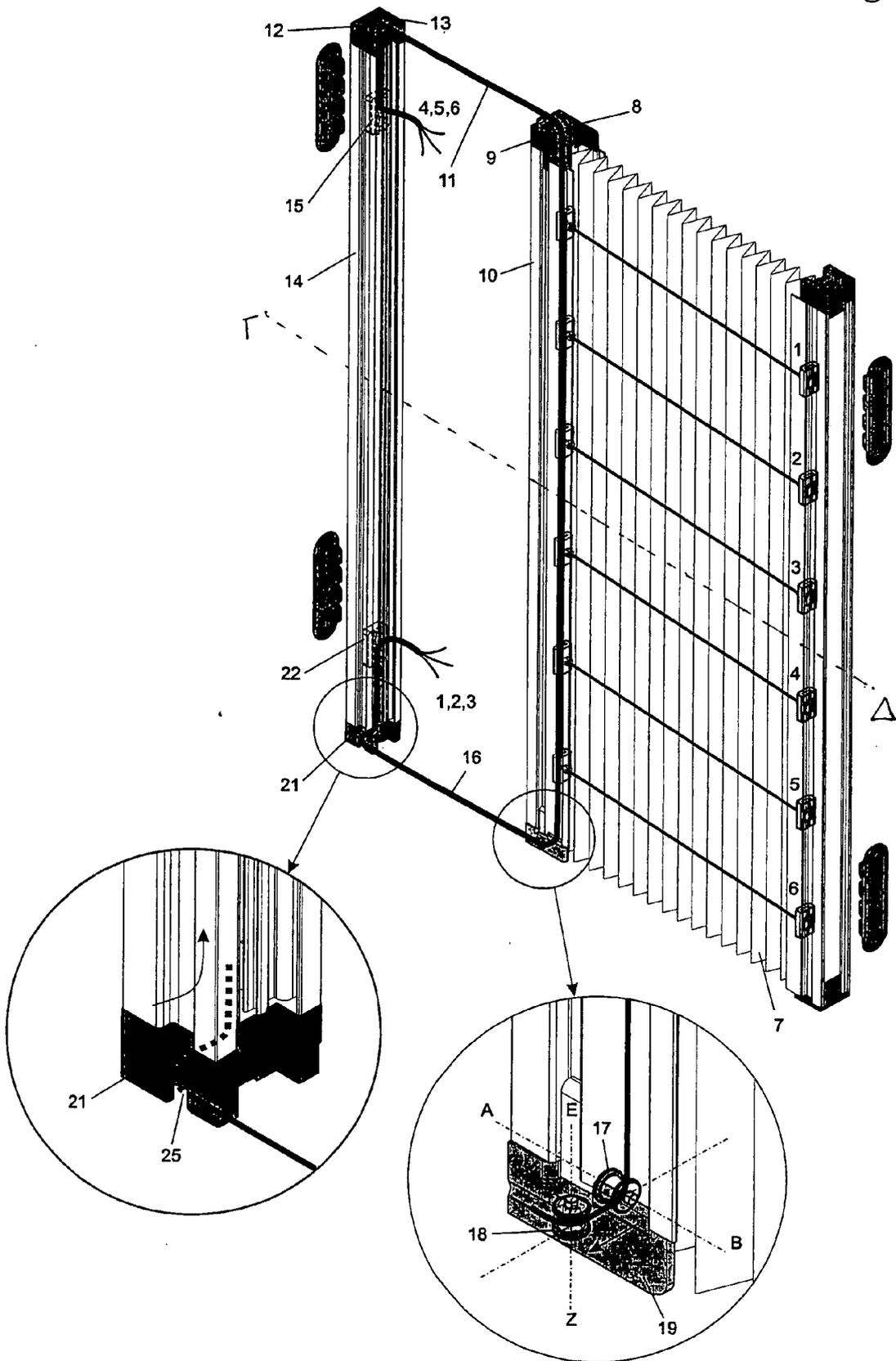
3. Anti-mosquito net rope movement system (7) according to claims 1 and 2, **characterised by** the fact that the axis A-B of the transit pulley (17) is parallel to the axis C-D direction of the net (7), while the axis E-F of the direction pulley (18) is vertical to the axis C-D direction of the net (7) and consequently to the axis A-B of the transit pulley (17).

4. Anti-mosquito net rope movement system (7) according to claims 1 and 2, **characterised by** the fact that instead of the pulleys (17) and (18), the bundle

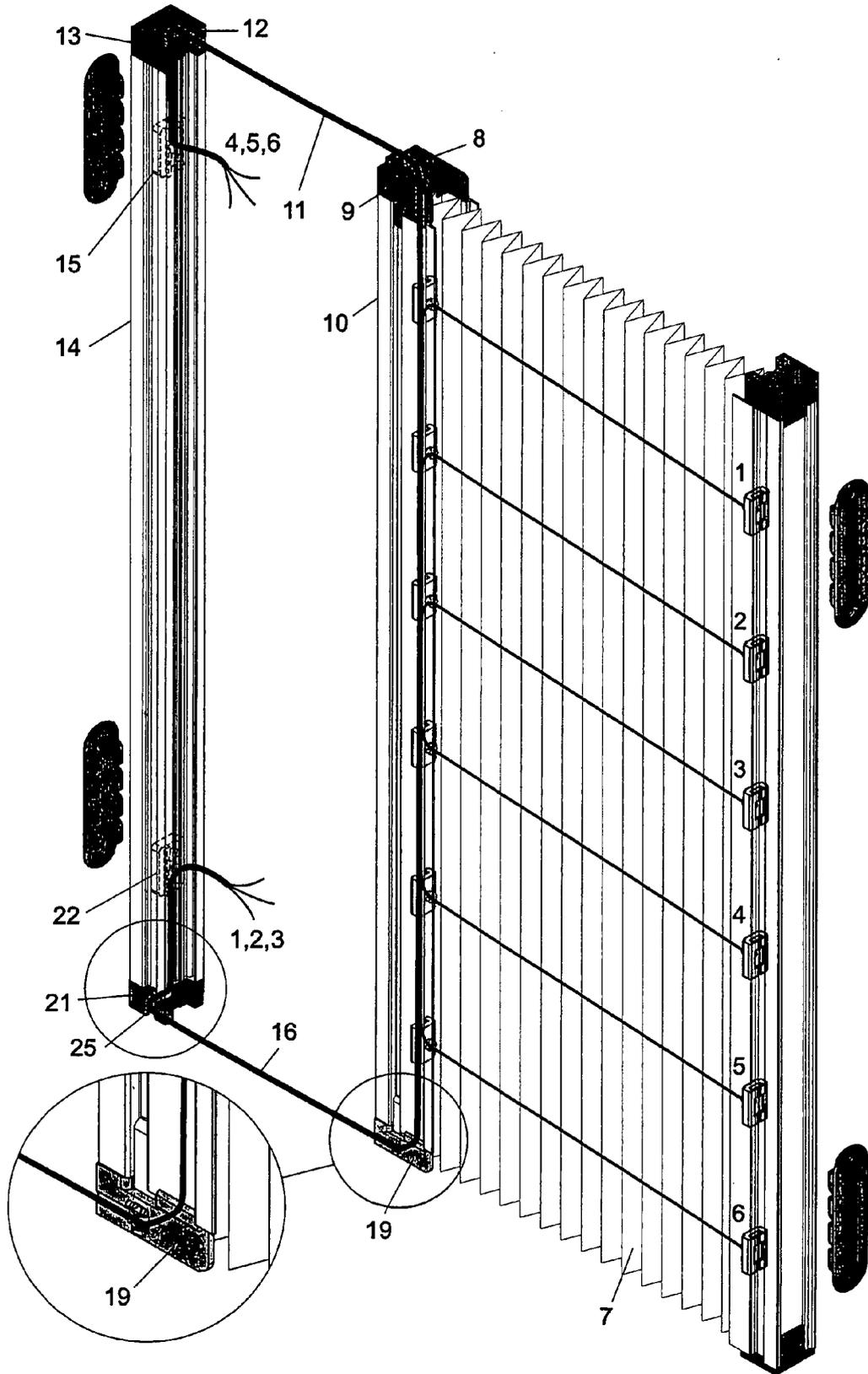
Drawing 1



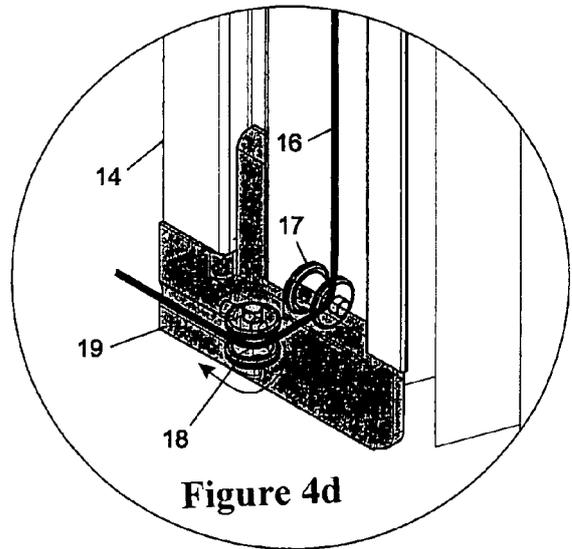
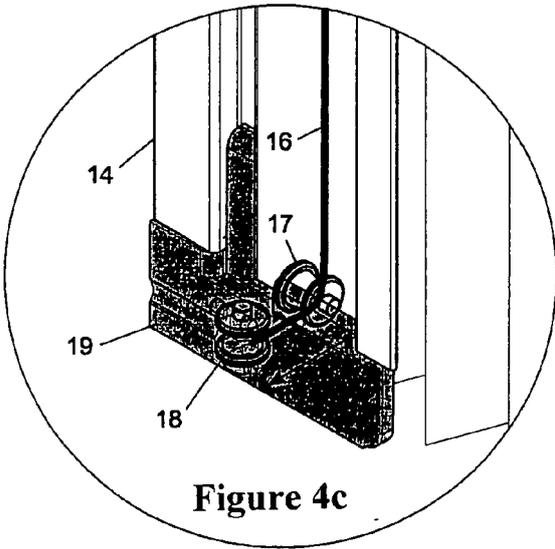
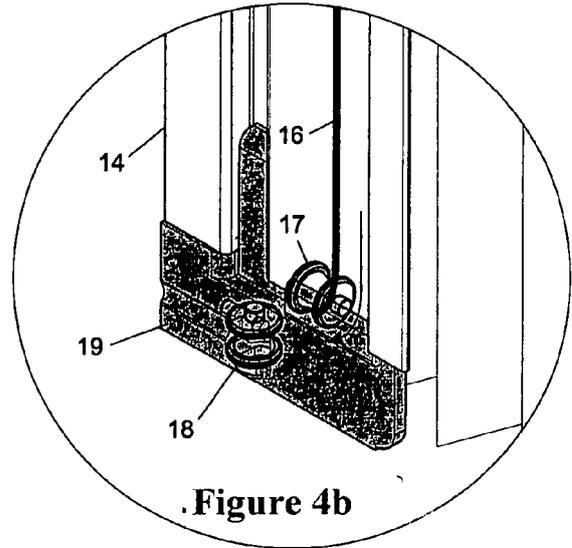
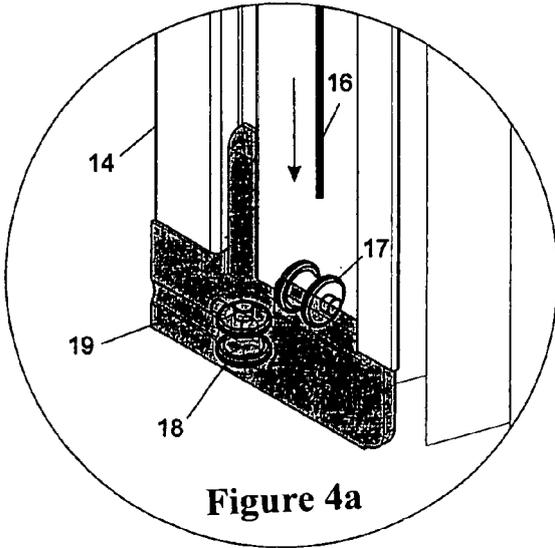
Drawing 2



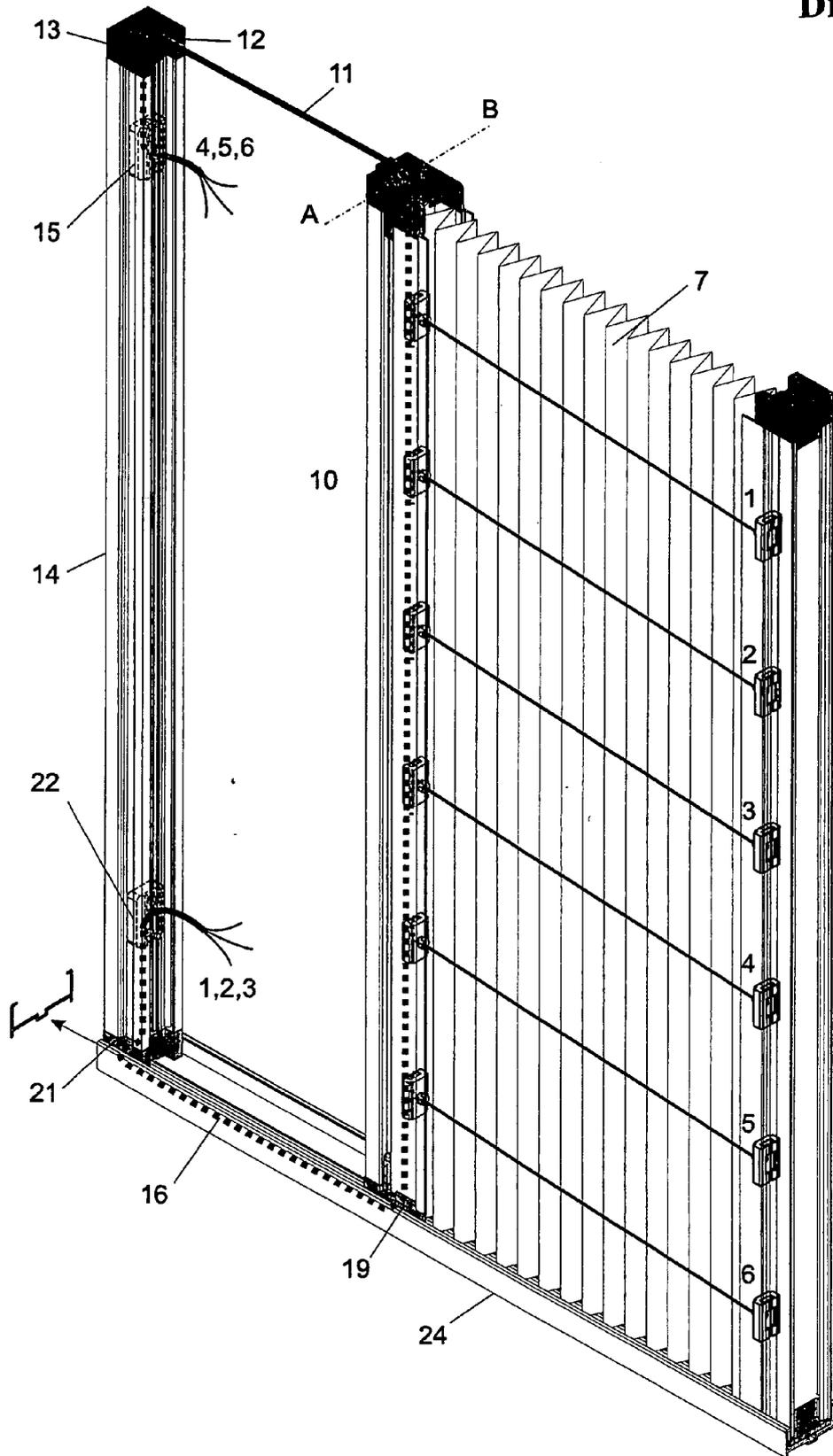
Drawing 3



Drawing 4



Drawing 5





EUROPEAN SEARCH REPORT

Application Number
EP 11 38 6022

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 157 274 A2 (METACO INC [JP]) 24 February 2010 (2010-02-24) * paragraph [0018] - paragraph [0038]; figure 1 *	1,4	INV. E06B9/52
A	----- JP 9 105284 A (FUJISASH CO; METACO KK) 22 April 1997 (1997-04-22) * abstract; figure 4 *	1-4	
A	----- JP 2001 152765 A (SANWA SHUTTER CORP) 5 June 2001 (2001-06-05) * figures 1,1A,1B *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
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
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 38 6022

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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03-05-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2157274	A2	24-02-2010	
		AU 2009201950 A1	25-02-2010
		BR PI0902160 A2	13-04-2010
		CN 101644129 A	10-02-2010
		EP 2157274 A2	24-02-2010
		JP 2010037857 A	18-02-2010
		TW 201007004 A	16-02-2010
		US 2010032109 A1	11-02-2010

JP 9105284	A	22-04-1997	
		JP 2820674 B2	05-11-1998
		JP 9105284 A	22-04-1997

JP 2001152765	A	05-06-2001	NONE

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0549209 A1 [0009]
- EP 2157274 A2 [0009]