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(54) **Guide elements of movable mosquito nets**

(57) Guide elements of movable mosquito nets in which the sheet (13) of the mosquito net is housed in a frame among rigid vertical uprights, of which one is fixed (10) and one is movable (11), manual or electric control means adapted to bring the sheet from an open position to a closed position and vice versa; the mosquito net being provided with at least lower guide means (14), each formed by two side walls (21) linked by a crossbeam (22) for containing the lower end of the sheet (13) among the side walls (21); the guide elements (14) being mutually hinged (24, 25), in a detachable way at the hinges themselves; means adapted to rotate each one with respect to their adjacent ones, between two extreme positions being provided, of which the first one where the two elements are aligned and the second one in which they are rotated by approximately 90° one with respect to the other; characterized in that at the hinges (24, 25) means (27, 28) adapted to permit the separation between two adjacent elements (14) are provided, only when these are rotated in the second of said two extreme positions.

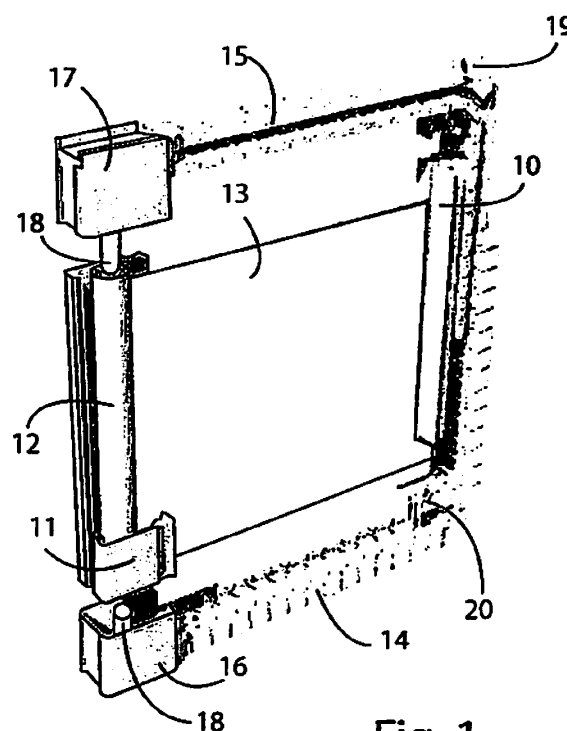


Fig. 1

Description

[0001] The invention refers to guide elements of movable mosquito nets.

[0002] The movable mosquito nets normally are of two kinds: the ones that can be wound around a roll or the ones pleated and foldable upon themselves. In both cases it is convenient to provide them with guide means placed on their upper and lower sides which keep to maintain stretched the sheet of the mosquito net in the opening and closing movements of the sheet itself. These guides are used since a long time and are normally made by a plurality of mutually hinged elements each of those is formed by two side walls linked by a crossbeam with their upper and lower ends of the sheet being maintained inside the two side walls during the opening and closing steps of the sheet.

[0003] Two examples of these guide elements are configured in Patents JP 6-158961 and EP 999.335.

[0004] The hinges among the elements are such to permit their rotation within the fixed upright when the sheet when it is closed (retracted); in the case of the application T02006A000670 in the name of the Applicant, for example, the elements forming the guides are so dimensioned in order to be inserted one into the other at the inside of the upright in order to spare space making uprights with a small thickness.

[0005] However, the main drawback of these guide elements consists in that by opening and closing repeatedly the sheet, they risk to detach one from the other precisely just at their hinging position, simply consisting in two pins of the side walls of each ones which are inserted into holes of the side walls of the adjacent ones.

[0006] It is also an aim of the invention to configure the elements in a way such that the insertion of the in into the other is done without difficulties and is safe from jamming.

[0007] For these and further aims which will be better comprised in the following, the invention proposes to realize guide elements of movable mosquito nets wherein the sheet of the mosquito net is contained within a frame among vertical rigid uprights, of which one is fixed and the other one is movable, manual or electric control means adapted to bring from an open position to a closed position and vice versa; the mosquito net being provided with at least lower guide means each of them made by two side walls linked by a crossbeam, in order to house the lower end of the sheet among the side walls; the guide elements being mutually hinged, in a separable way at hinging positions; means being provided for permitting to the elements to rotate each with respect to their adjacent ones between two extreme positions of which the first is that in which the two elements are aligned and the second one is that in which they are rotated of approximately 90° one with respect to the other; characterized in that at the hinging positions means are provided adapted to permit the separation between two adjacent elements only when these are rotated in the second of said

two extreme positions.

[0008] Now, the elements according to the invention will be described with reference to the annexed drawings in which:

Fig. 1 is the perspective view of mosquito net of the kind which can be wound, provided with the elements according to the invention;

Fig. 2 is the partial view of the sheet of the mosquito net at the lower guide elements;

Fig. 3 and 4 are perspective views of the guide elements of the respective lower and upper guide elements according to the invention;

Fig. 5, 6 and 7 are respectively the front and side end view of the

Figures 3 and 4 inserted one into the other.

[0009] As already said the mosquito net shown in the Figure is of the kind which can be manually wound simply as an example, but it has to be understood that the guides subject of the invention can be applied at the same way also on pleated mosquito nets, i.e. with the sheet being foldable instead than rolling and with an electric instead than a manual control.

[0010] The mosquito net has, in a known way, a fixed profile 10 and a movable one 11; the latter carries an internal roll 12 upon which sheet 13 is wound which at its other end is anchored to fixed profile 10.

[0011] In the solution that will be now described with reference to the figures, the mosquito net is provided with two guide elements of the sheet, one of which is lower and the other one is upper, but in certain cases the guide elements can only be lower, as the upper ones are not absolutely indispensable.

[0012] In the mosquito nets tension cords are also normally provided in order to permit the tensioning of the guide means. They will not be described as they are not the subject of the invention and the man skilled in the art perfectly knows how to place them for the aim to which they are destined.

[0013] Therefore Figure 1 shows a lower guide elements 14 and an upper guide elements 15, fixed at one of their ends to respective heads 16 and 17 which are provided with pins 18 which are inserted with interference in the lower and upper ends of roll 12; the other ends of guide elements 14 and 15 pass through heads 19 and 20 of fixed profile 10 and are inserted by sliding into this latter.

[0014] Lower guide elements 14 are generally made by two side walls 21 linked by a crossbeam 22; side walls 20 are provided with rigid appendixes or pedicles 23 extending until mutually touching themselves.

[0015] As can be seen in Figure 2, the task of the pedicles, which were already the subject of the European Patent EP 1.905.944 of the Applicant, is to insert themselves into the meshes of the lower end of sheet 13 in order to avoid that this flutters when the sheet is stretched and for keeping it in position when the sheet of the mos-

quito net is opened/closed.

[0016] Side walls 21 are also provided with hinging means among adjacent elements.

[0017] Each wall 21 has respectively at its ends a hole 24 and a pin 25, such that two pins 25 of an element 14 can be inserted in two holes 24 of the adjacent element and so on, in order to create a kind of chain.

[0018] Undercuts 26 are obtained in walls 21 in order to permit to the two adjacent elements to rotate between two extreme positions of which one is straight, as shown in figures 6 and 7, and one is pleated, where an element is rotated by approximately 90° with respect to the other.

[0019] According to the invention, holes 24 are not perfectly circular, but from each one of them a lobe 27 develops in the length facing respective pin 25.

[0020] In the same way pins 25 are provided with appendixes 28 protruding from their ends in a direction opposite to crossbeam 22 and to holes 24.

[0021] In such a way, pins 25 can be inserted in holes 24 only when the two elements 14 to be linked are placed in the above mentioned pleated position, i.e. one of them rotated by 90° with respect to the other one, because only in this mutual position, appendixes 28 of pins 25 coincide with lobes 27 of holes 24.

[0022] In this way it is not expectable that during the utilization of mosquito net 13, elements 14 being mutually hinged, can detach one from the other, making impossible to close or open the sheet until the restoring of the hinge.

[0023] Upper elements 15, which as already said, can be present or not, are better illustrated in the figures 4 and 5. Such elements seem completely different from lower ones 14; actually they are different for the fact that side walls 21' extending from crossbeam 22' are no more rectilinear such as in the lower elements, but they have each a "C" shape intermediate segment 30, pleated toward the inside, in order to face the one of adjacent wall 21'.

[0024] As can be better seen in figure 5 in the length where elements 14 e 15 (see figure 1) are destined to insert one into the other, segments 30 of element 15 "C"-pleated pass among pedicles 23 without touching them and so damaging them.

[0025] Pins 25 and holes 24 are obtained as in the lower elements and they have the same physical features and the same functions of the other ones, and so it is not necessary to repeat their description.

lower (14) each of them formed by two side walls (21) linked by a crossbeam (22) in order to house the lower end of the sheet (13) among the side walls (21); the guide elements (14) being mutually hinged (24,25), in a detachable way in the hinges area; being provided means adapted to permit to the elements (14) to rotate each one of them with respect to the other, between two extreme positions of which one is fixed and in which the two elements are aligned and the second of which are rotated by approximately 90° one with respect to the other; **characterized in that** at the hinges(24,25) means(27,28) are provided, adapted to permit the separation between two adjacent elements (14) only when these are rotated in the second of said two extreme positions.

2. Elements according to claim 1 in which the hinges are formed by pins (25) and holes (24) obtained in each side wall (21) of each element (14), **characterized in that** said means (27,28) adapted to permit the separation between two adjacent elements (14) are side appendixes (28) of the pins (25) adapted to house in respective lobes (27) of the holes (24).

3. Elements according to claim 1 **characterized in that** the guide elements other than lower (14) are also upper elements (15).

4. Elements according to claim 3 **characterized in that** the upper elements (15) are provided with the same hinging means (24, 25) and separation means (27, 28) with which the lower elements (14) are provided.

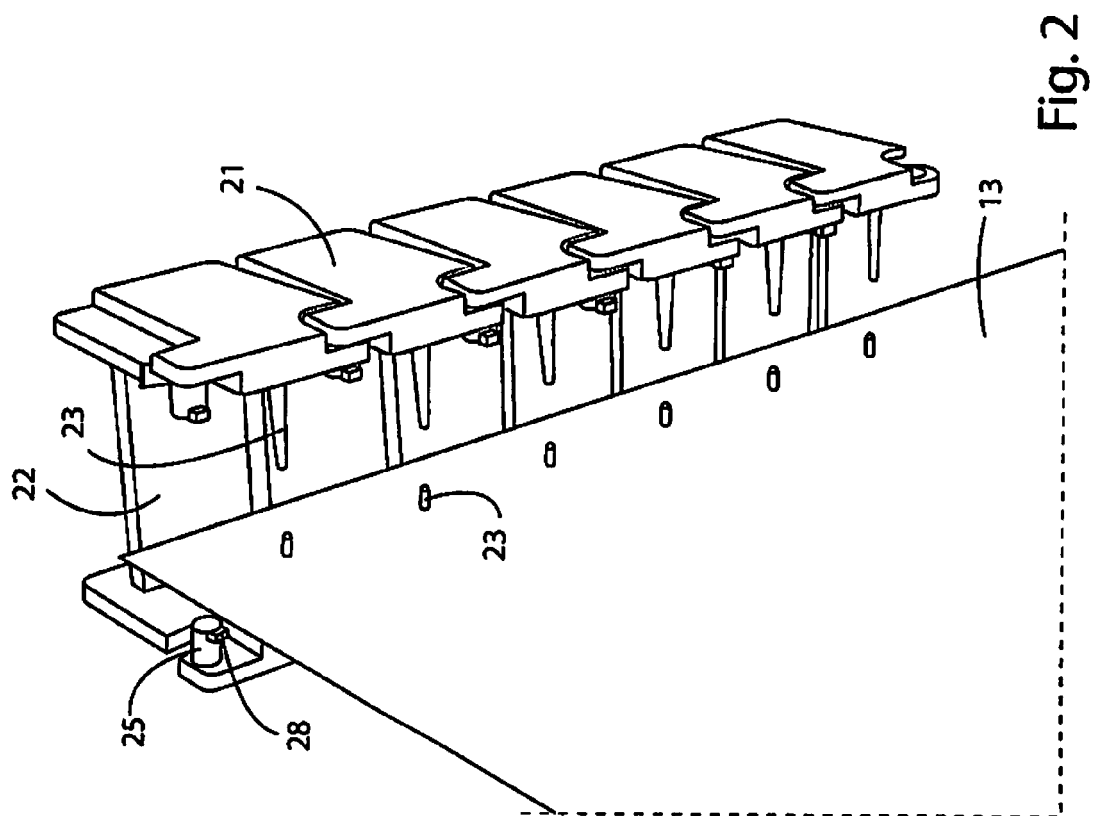
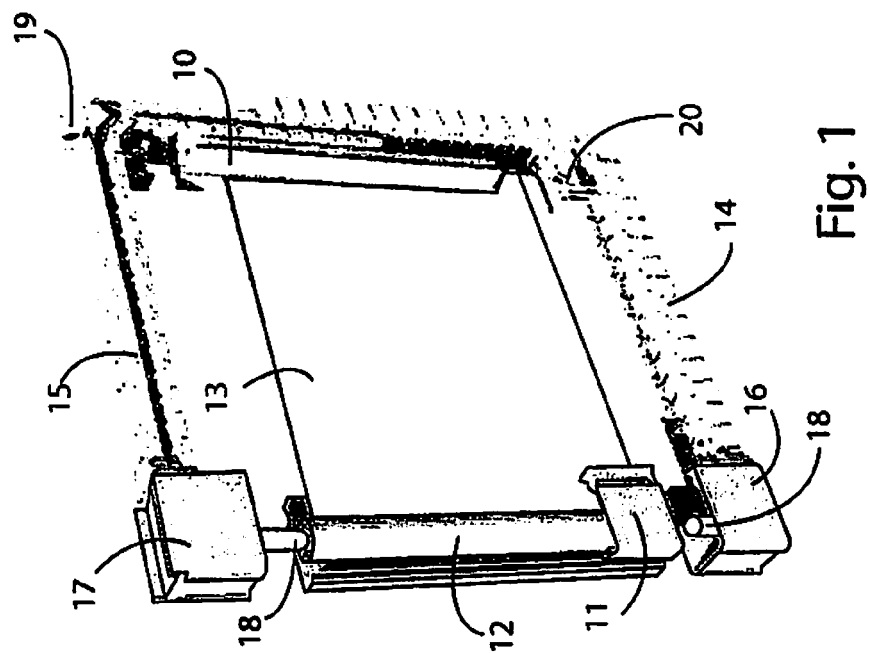
5. Elements according to claim 4, **characterized in that** the lower elements (14) are provided with pedicles (23) extending from the side walls (21) towards the inside and they are able to engage with the meshes of the lower end of the sheet (13).

6. Elements according to claim 4, **characterized in that** they are dimensioned such that they can slide the upper one (15) into the lower one (14).

7. Elements according to claims 4 and 5 **characterized in that** the side walls (21) of the intermediate length (30) "C"-pleated towards the inside in order to permit its introduction in the lower one without touching the pedicles.

Claims

1. Guide elements of movable mosquito nets in which the sheet (13) of the mosquito net is housed in a frame among rigid vertical uprights, of which one is fixed (10) and one is movable (11), manual or electric control means adapted to bring the sheet from an open to a closed position and vice versa; the mosquito net being provided with guide means at least



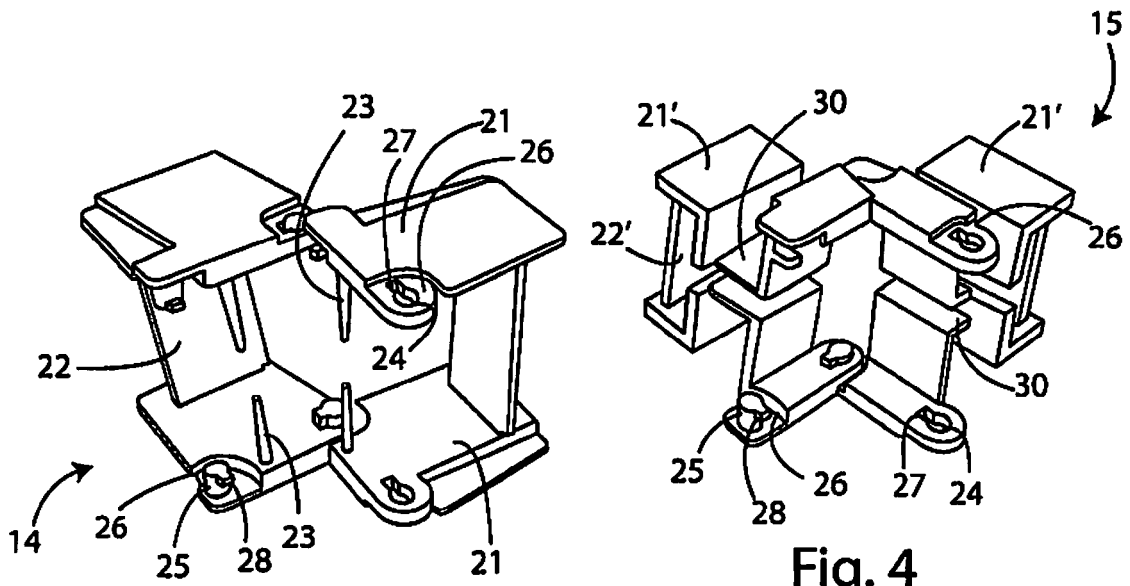


Fig. 3

Fig. 4

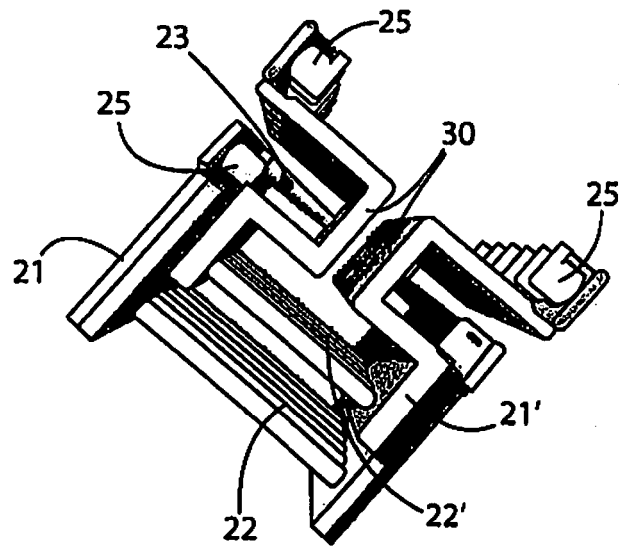


Fig. 5

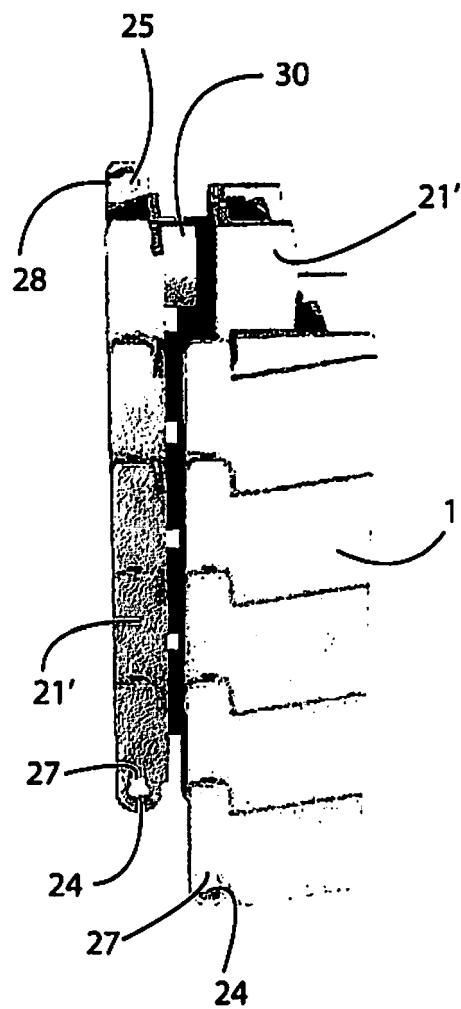


Fig. 6

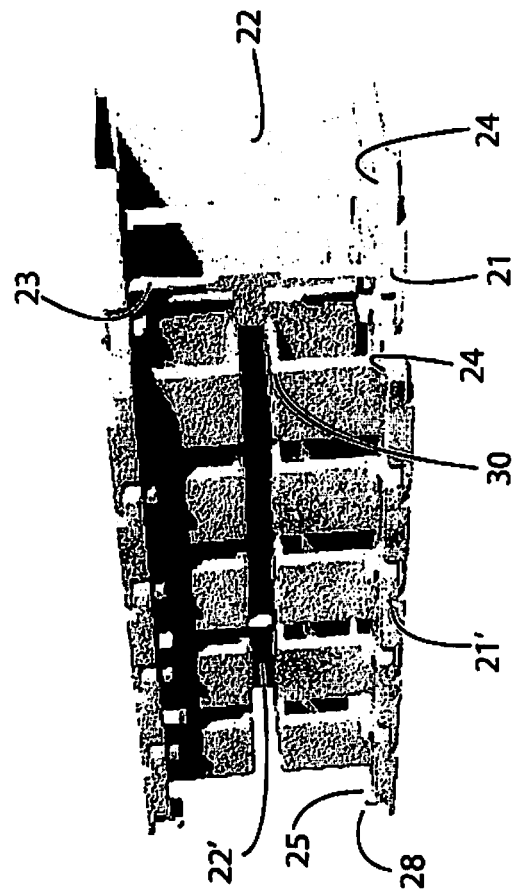


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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