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(54) **Pleated screen device**

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Description

[0001] Pleated screens, such as in particular but not exclusively, mosquito nets, are devices that present as principal characteristic that of having the screen of a type that can be folded up in a concertina fashion.

[0002] In order for the screen, during folding, to maintain its plane conformation, i.e., for it not to warp or buckle, it is necessary for cords to extend along the screen, tensioned between the rigid vertical sectional elements that support the side ends of the screen. These cords are provided at their ends with tensioning systems that keep them always tensioned and consequently maintain the screen in a plane configuration.

[0003] One of the main drawbacks of this type of screens lies in the very fact that traditionally the system of cords and tensioners that is provided is rather complex and elaborate. This system, then, is normally also of rather large overall dimensions, and it is difficult to gain access thereto to carry out any operations of maintenance and replacement of the cords of the system.

[0004] An example of these screens is illustrated in the patent EP-999,335, where it may be noted how the design of the tensioners for the cords on the lateral sectional elements entails very complex and laborious intertwinings.

[0005] This means that the sectional elements that carry the tensioners must be of large overall dimensions and that the installer who has to see to intertwining of the tensioners finds himself in considerable difficulty, since he has to install for each screen the entire system starting from scratch, without being able to use pre-assembled kits, which simplify and accelerate the task of installation.

[0006] The main purpose of the present invention is to propose a screen that will overcome the aforementioned drawbacks and in particular will present an intertwining of tensioners for the cords that is extremely simple but at the same time very functional, will enable fast and convenient maintenance operations to be carried out, and will moreover make it possible to create kits that will simplify and speed up the job of the installer of the device *in situ*.

[0007] A purpose of the present invention is also to provide a device in which the intertwining of cords and tensioners does not require large overall dimensions inside the uprights that support it, improving the appearance of the finished device.

[0008] For the above and further purposes that will be understood more fully hereinafter, the purpose of the invention is to provide a pleated screen device according to claim 1 the preamble of which is constituted by EP-1653038.

[0009] The device according to the invention will now be described with reference to the attached plates of drawings, in which:

- Figure 1 illustrates a screen in a perspective exploded view;
- Figures 2 and 3 illustrate each in two different views two details; and
- Figure 4 illustrates in greater detail a part of the screen of Figure 1.

[0010] A device as may be noted in particular in Figure 1, presents a screen 10 inserted between vertical sectional elements 11 and 12, the first one 11 of which is fixed and the second one 12 can be moved manually from a position in which it is set up against the fixed sectional element 11 and the screen 10 is closed, folded up on itself, to a position in which the mobile sectional element 12 is set up against the frame of the framework for containing the device (not represented for reasons of convenience of illustration) and the screen 10 is open.

[0011] The slidable sectional element 12 is guided in its movements of translation through guide chains, a top one 14 and a bottom one 15, of which the top one is able to slide in a respective guide made in the frame of the framework.

[0012] The two guide chains 14 and 15 (see Figures 2 and 3) are constituted by a plurality of guide elements having vertical walls (the bottom ones 16 substantially circular, and the top ones 16' substantially oval), joined by a cross member 17 and 17' and hinged to one another to form respective top and bottom continuous guide chains.

[0013] For the reasons that will be better understood hereinafter, the two guide chains 14 and 15 formed by the guide elements 14 and 15 are of different dimensions; namely, the bottom one 15 is of larger dimensions than the top one 14.

[0014] Extending in a direction transverse to the screen 10, in a traditional way, are cords, in a variable number according to the dimensions of the screen itself, which, as has already been said, have the purpose of preventing any oblique deformation during opening and closing.

[0015] For reasons of simplicity, we consider the case where the cords 18 and 19 are two in number, as illustrated in Figures 1 and 4. At one end of their own, the cords 18 and 19 are fixed to the mobile frame 12 and extend woven onto the screen 10 as far as the fixed frame 11, where they are prolonged as described in what follows.

[0016] One of the two cords, for example the top one 18, proceeds with the extension 18' within the fixed sectional element 11, passing through a hole thereof, downwards as far as a return roller 20 fixed to a base body 21 applied in a removable way to the fixed sectional element 11. The tensioner 18' then proceeds with the stretch 18" as far as the end element 15' of the bottom guide chain 15, to which it is fixed in 23.

[0017] The other cord 19, with its extension 19', also enters the fixed sectional element 11, through another hole, and proceeds upwards as far as a second return roller 25 fixed to a top body 22, which is also applied in a removable way to the fixed sectional element 11. The

tensioner 19' then proceeds, with the stretch 19", as far as the end element 14' of the top guide chain 14, to which it is fixed in 24.

[0018] As may be noted, the system of cords 18 and 19 and tensioners 18', 18" and 19', 19" is very simple both as regards its intertwining and as regards its operation. In fact, when the screen 10 is completely distended (opened), the two sets of top-guide elements and bottom-guide elements are largely slid out of the vertical sectional element 11 and are arranged horizontally along the guides of the frame so that also their end elements 14' and 15' are very close to one another in the vertical sectional element 11, as may be noted in Figures 1 and 4.

[0019] The cords 18 and 19, however, always remain at a constant tension along the screen 10, since they are fixed to the aforesaid end elements 14' and 15' of the guide elements and they reduce, as the screen opens, their portions 18', 18" and 19', 19" inside the sectional element 11, performing a function of tensioners.

[0020] When, instead, the screen 10 recloses, the two guide chains formed by the two sets of guide elements translate increasingly inside the sectional element 11 until they set themselves alongside one another almost for the entire length of the sectional element 11.

[0021] This is why it is convenient to make the top guide chain 14 (which is subject to lower stresses) of smaller dimensions than the bottom guide chain 15. The space that they occupy when they are set alongside one another is a little greater than that occupied by just one guide chain.

[0022] In addition, as may be noted, the return rollers 20 and 25 are positioned in such a way that the tensioners 18', 18" and 19', 19" are located only in the internal part of the sectional element 11, i.e., the one facing the screen 10. Otherwise, if the tensioners were to unwind also on the other side, i.e., towards the frame, the lateral encumbrance of the system of tensioners and guides would be much greater.

[0023] Consequently, with this arrangement of the cords and tensioners set between the guide elements and the screen, a configuration of the device is obtained that is of limited overall dimensions and at the same time extremely functional.

[0024] By making then the guide elements, one (for example, the bottom one) of normal dimensions, and one (for example, the top one) of smaller dimensions, the lateral encumbrance is further reduced, with the additional advantage of improving the aesthetic appearance of the device.

[0025] This particular type of intertwining of tensioners then makes it simple to form a kit made up of two sectional elements containing the screen and the cords that traverse it.

[0026] The kit, in fact, will be constituted by the sectional elements 11 and 13 with the screen 10 inserted therein and the tensioners 18' and 19' pre-wound and maintained provisionally at their own free ends 23 and 24 in purposely provided hooks of the sectional element 11.

[0027] For the installer it will be simple to slide the sectional element 11 into the bottom and top sectional elements, in which the guide elements slide, and to cause passage of the cords 18 and 19 that come out of the sectional element itself through the return rollers 21 and 22 as far as the end elements 14' and 15' of the guide elements, where they are fixed in 23 and 24. The entire operation requires very short times for assembly and a simplicity of assembly that can render the system even within the reach of beginners and end users.

[0028] Advantageously, the vertical sectional elements 11 and 12 are fixed by means of magnets to the containment frame so as to enable ease of extraction of the screen 10 from its seat, without any need to use screwdrivers or other tools.

Claims

1. A pleated screen device, constituted by a screen (10) inserted between vertical sectional elements (11 and 12), the first one (11) of which is fixed and the second one (12) can be moved manually from a position in which it is set up against the fixed sectional element (11) and the screen (10) is closed, folded up on itself, to a position in which the mobile sectional element (12) is set up against the frame of the framework for containing the device and the screen (10) is open; the mobile sectional element (12) being guided in its movements of translation through guide chains, a top one (14) and a bottom one (15), which are able to slide in respective guides made in the frame of the framework; extending in a direction transverse to the screen (10) are cords (18 and 19), which at one end of their own are fixed to the mobile sectional element (12) and extend along the screen (10) as far as the fixed sectional element (11), where they are prolonged to form a tensioning system; one (18) of the cords, if the cords number is two, or else a set of cords, if the cords number is more than two, extends (18') in the fixed sectional element (11), passing through a hole thereof, downwards as far as a return roller (20) fixed to a base body (21) applied in a removable way to the fixed sectional element (11) and proceeds (18") as far as the end element (15') of the bottom guide chain (15), to which it is fixed (23); the other cord or set of cords (19) also entering, with its extension (19'), the fixed sectional element (11), through another hole, and proceeding upwards as far as a second return roller (25) fixed to a top body (22), which is also applied in a removable way to the fixed sectional element (11); said extension (19') proceeding (19") as far as the end element (14') of the top guide chain (14), to which it is fixed (24), whereby

   the two guide chains (14 and 15) art constituted by a plurality of elements having vertical walls (16),

joined by a cross member (17) and hinged to one another to form respective top and bottom continuous chains, the pleated screen device being **characterized in that** the two guide chains (14 and 15) formed by the guide elements are of different dimensions; namely, the bottom one (15) is of larger dimensions than the top one, and **in that**, during the step of opening of the screen, i.e., when the mobile sectional element (12) is pulled towards the fixed one (11), the guide chain of smaller dimensions (1) slides partially inside that of larger dimensions (15).

2. The device according to Claim 1, **characterized in that** the return rollers (20 and 25) are positioned in such a way that the extensions (18', 18" and 19', 19") of the cords (18 and 19) are all in the internal part of the fixed sectional element (11), i.e., the one facing the screen (10).

3. The device according to Claim 1, **characterized in that** the top guide chain (14) slides in a U-shaped sectional element (9) that forms the frame.

4. The device according to Claim 1, **characterized in that** the vertical sectional elements (11 and 12) are fixed by means of magnets to the containment frame.

Patentansprüche

1. Faltstorevorrichtung, aufgebaut durch eine Abschirmbahn (10), welche zwischen vertikale Profilelemente (11 und 12) eingeschoben ist, wobei das erste (11) davon feststehend ist und das zweite (12) händisch von einer Position, in der es gegen das feststehende Profilelement (11) angelegt ist und die Abschirmbahn (10) geschlossen ist, auf sich selbst zusammengefaltet ist, in eine Position, in welcher das bewegliche Profilelement (12) gegen den Rahmen des Rahmenaufbaus zum Umfassen der Vorrichtung angelegt ist und die Abschirmbahn (10) offen ist; wobei das bewegliche Profilelement (12) in seinen Verschiebungsbewegungen durch Führungsketten, einer oberen (14) und einer unteren (15), geführt zu werden, welche in der Lage sind, in entsprechenden Führungen, die im Rahmen des Rahmensaufbaus ausgeführt sind, zu gleiten; wobei sich in eine Richtung quer zur Abschirmbahn (10) Schnüre (18 und 19)erstrecken, welche an ihrem einen Ende am mobilen Profilelement (12) befestigt sind und sich entlang der Abschirmbahn (10) bis zum feststehenden Profilelement (11) erstrecken, wo sie weitergeführt sind, um ein Spannsystem auszubilden; wobei eine (18) der Schnüre, wenn die Anzahl der Schnüre zwei beträgt, oder sonst ein Satz Schnüre, wenn die Anzahl der Schnüre mehr als zwei beträgt, sich (18') im feststehenden Profilelement (11), wobei sie durch ein Loch ebendort hindurchgeht, nach unten so weit bis zu einer Umkehrrolle (20) erstreckt, welche an einem Grundkörper (21), der auf eine entfernbare Weise am feststehenden Profilelement (11) angebracht ist, befestigt ist, und sich weitererstreckt (18") bis zu einem Endelement (15') der unteren Führungskette (15), an welcher sie befestigt ist (23); wobei die andere Schnur oder der Schnursatz (19) auch mit seiner Verlängerung (19') in das feststehende Profilelement (11) durch ein anderes Loch hineinläuft und sich weiter nach oben bis zu einer zweiten Umkehrrolle (25) erstreckt, welche an einem oberen Körper (22), der ebenfalls auf eine entfernbare Weise am feststehenden Profilelement (11) angebracht ist, befestigt ist; wobei die Verlängerung (19') sich (19") so weit bis zum Endelement (14') der oberen Führungskette (14) weitererstreckt, an welchem sie befestigt ist (24),
wobei die zwei Führungsketten (14 und 15) aus einer Mehrzahl von Elementen aufgebaut sind, welche vertikale Wände (16) aufweisen, die durch ein Querelement (17) verbunden sind und miteinander gelenkig verbunden sind, um jeweils obere und untere fortlaufende Ketten auszubilden,
wobei die Faltstorevorrichtung **dadurch gekennzeichnet ist, dass** die zwei Führungsketten (14 und 15), welche durch die Führungselemente ausgebildet sind, von unterschiedlichen Abmessungen sind; nämlich die untere (15) von größerer Abmessung als die obere ist, und dass während des Schritts des Öffnens der Abschirmbahn, d.h. wenn das bewegliche Profilelement (12) in Richtung des feststehenden Elements (11) gezogen wird, die Führungskette mit der kleineren Abmessung (1) teilweise innerhalb jener mit der größeren Abmessung (15) gleitet.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Umkehrrollen (20 und 25) auf solch eine Weise positioniert sind, dass die Verlängerungen (18', 18" und 19', 19") der Schnüre (18 und 19) alle im inneren Teil des feststehenden Profilelements (11), d.h. in jenem, das der Abschirmbahn (10) zugewandt ist, aufgenommen sind.

3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die obere Führungskette (14) in einem U-förmigen Profilelement (9) läuft, welches den Rahmen bildet.

4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die vertikalen Profilelemente (11 und 12) mittels Magneten an den Umfassungsrahmen befestigt sind.

Revendications

1. Dispositif à grillage plissé, constitué d'un grillage (10) inséré entre des éléments sectionnels verticaux (11 et 12), dont le premier (11) est fixe et le second (12) peut être déplacé manuellement d'une position dans laquelle il est disposé contre l'élément sectionnel fixe (11) et le grillage (10) est fermé, replié sur lui-même, à une position dans laquelle l'élément sectionnel mobile (12) est disposé contre le cadre du bâti destiné à contenir le dispositif, et le grillage (10) est ouvert ; l'élément sectionnel mobile (12) étant guidé dans ses mouvements de translation par l'intermédiaire de chaînes de guidage, une supérieure (14) et une inférieure (15), qui sont aptes à coulisser dans des glissières respectives profilées dans le cadre du bâti ; des cordes (18 et 19) qui s'étendent dans un sens transversal par rapport au grillage (10) sont fixées par une de leurs extrémités à l'élément sectionnel mobile (12) et s'étendent le long du grillage (10) jusqu'à l'élément sectionnel fixe (11) où ils se prolongent pour former un système de tension ; une (18) des cordes, si les cordes sont au nombre de deux, ou bien un jeu de cordes, si les cordes sont d'un nombre supérieur à deux, s'étend (18') dans l'élément sectionnel fixe (11), en traversant un orifice de celui-ci, vers le bas, jusqu'à un rouleau de rappel (20) fixé à un corps de base (21) appliqué de manière amovible sur l'élément sectionnel fixe (11), et elle avance (18") jusqu'à l'élément d'extrémité (15') de la chaîne de guidage inférieure (15) auquel elle est fixée (23) ; l'autre corde ou jeu de cordes (19) pénètre également au moyen de son extension (19') dans l'élément sectionnel fixe (11) à travers un autre orifice, et avance vers le haut jusqu'à un second rouleau de rappel (25) fixé à un corps supérieur (22) lui aussi appliqué de manière amovible à l'élément sectionnel fixe (11) ; ladite extension (19') avance (19") jusqu'à l'élément d'extrémité (14') de la chaîne de guidage supérieure (14) auquel elle est fixée (24) ; moyennant quoi les deux chaînes de guidage (14 et 15) sont constituées d'une pluralité d'éléments dotés de parois verticales (16), reliés par une traverse (17) et articulés les uns aux autres pour former des chaînes continues respectives supérieure et inférieure; le dispositif à grillage plissé étant **caractérisé en ce que** les deux chaînes de guidage (14 et 15) formées par les éléments de guidage sont de dimensions différentes, à savoir que la chaîne inférieure (15) a des dimensions supérieures à celles de la chaîne supérieure ; et **en ce que**, lors de l'étape d'ouverture du grillage, c'est-à-dire quand l'élément sectionnel mobile (12) est tiré vers l'élément sectionnel fixe (11), la chaîne de guidage de dimensions inférieures (14) coulisse partiellement à l'intérieur de celle qui a des dimensions supérieures (15).

2. Dispositif selon la revendication 1, **caractérisé en ce que** les rouleaux de rappel (20 et 25) sont disposés de telle manière que les extensions (18', 18" et 19', 19") des cordes (18 et 19) sont toutes situées dans la partie intérieure de l'élément sectionnel fixe (11), c'est-à-dire celle qui est orientée vers le grillage (10).

3. Dispositif selon la revendication 1, **caractérisé en ce que** la chaîne de guidage supérieure (14) coulisse dans un élément sectionnel en forme de U (9) qui forme le cadre.

4. Dispositif selon la revendication 1, **caractérisé en ce que** les éléments sectionnels verticaux (11 et 12) sont fixés au cadre de retenue au moyen d'aimants.

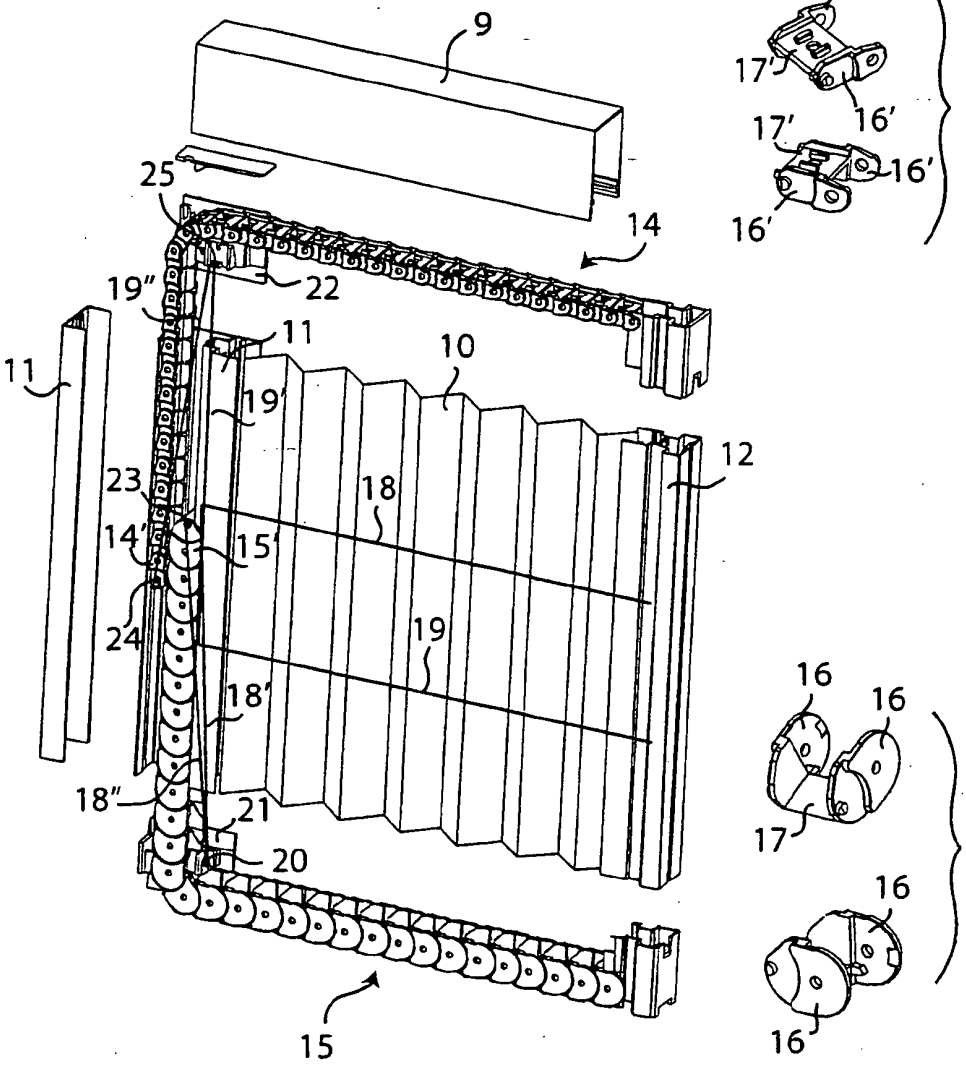


Fig. 1

Fig. 2

Fig. 3

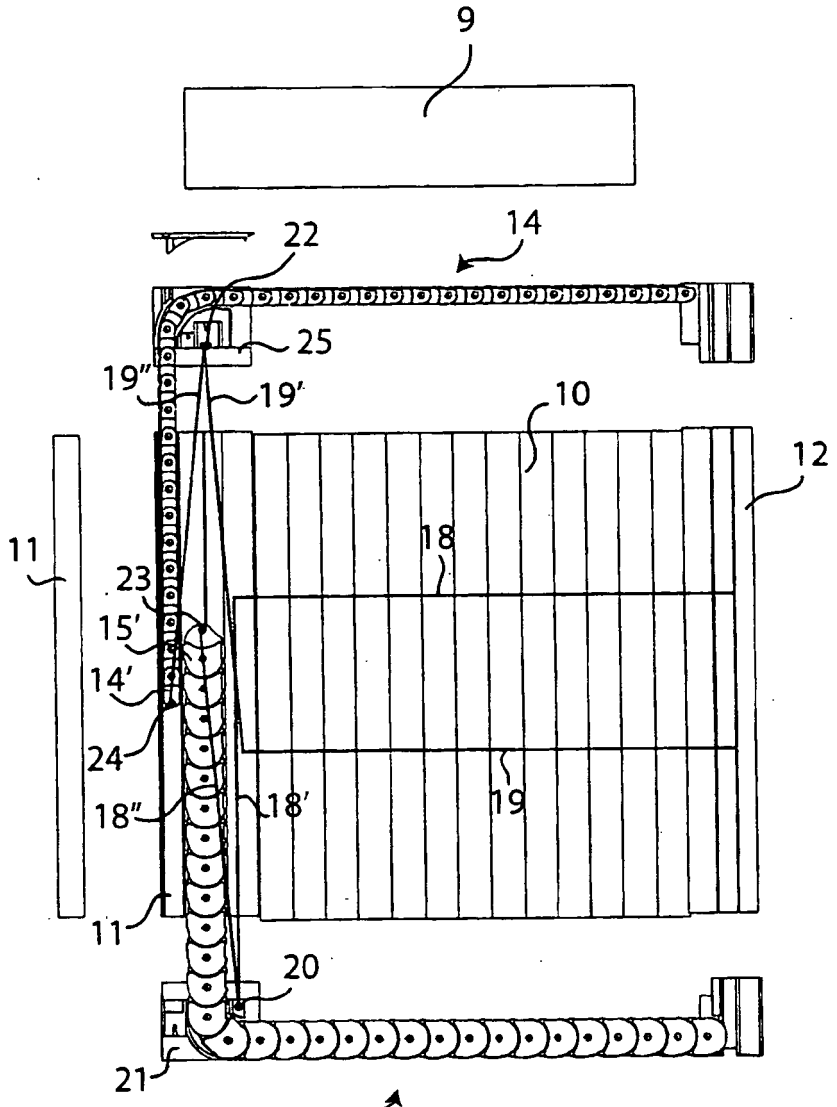


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- EP 1653038 A **[0008]**