

(19)



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(11)

**EP 0 807 199 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:

**09.09.1998 Bulletin 1998/37**

(21) Application number: **96901243.4**

(22) Date of filing: **23.01.1996**

(51) Int Cl.<sup>6</sup>: **E06B 9/24**

(86) International application number:  
**PCT/DK96/00037**

(87) International publication number:  
**WO 96/23949 (08.08.1996 Gazette 1996/36)**

(54) **DUAL SCREENING DEVICE FOR A WINDOW**

**DOPPELTE ABSCHIRMVORRICHTUNG FÜR EIN FENSTER**

**DISPOSITIF DOUBLE D'OBTURATION DE FENETRE**

(84) Designated Contracting States:  
**AT BE CH DE FR GB IT LI NL PT SE**

(30) Priority: **03.02.1995 DK 950044 U**

(43) Date of publication of application:  
**19.11.1997 Bulletin 1997/47**

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**EP 0 807 199 B1**

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## Description

The invention relates to a screening device for a window with a substantially rectangular sash having first and second pairs of sash members positioned opposite each other, said first and second pairs of sash members extending in the width and height direction of the window, respectively, and of the type comprising a first screening element with a breadth of a flexible screening material which in one end is rolled up on a roller tube fastened to one sash member in the first pair of sash members, and a second screening element which in one end is fastened to the second sash member in said first pair, where in connection with the second pair of sash members, guiding means are provided for guiding movement of the two screening elements in a direction parallel to said second pair of sash members, said guiding means at each sash member in said second pair comprising a side guide rail with a common track for the two screening elements, whereas both screening elements in the opposite end are connected with an end rail profile extending in parallel relationship with said first pair of sash members.

It is well known to provide windows with screening devices both for light dimming in the form of actual blackout as well as dimming of penetrating sun light in daylight hours, and for screening against insects.

In light-dimming screening devices to be positioned close to the window sash, it is, however, with the known devices not possible at one time to take more light-dimming purposes into account, eg. to provide a window with both a siesta roller blind and a venetian blind or a translucent pleated blind which may especially be desirable for roof windows in an oblique roof surface where the light incidence is considerably larger than in vertical windows.

DE Publication no 2934122 discloses a screening device of the above type in which a translucent and air permeable curtain at its upper end is connected with a carrying tube for connection with the lower end of a roller shutter. The screening device is operated in the way that by means of engagement means the curtain is coupled with the roller shutter and subsequently pulled out of its normally rolled up position to a desired placement in the elevation of the window. This arrangement, however, implies that the curtain may only be used together with the roller shutter which partly results in demands being made to the design and function of the engagement means and partly rules out the possibilities of optional screening combinations as the area of the window opening which is not covered by the roller shutter is either covered completely - by a coupled curtain - or not at all.

In the screening device disclosed in DE publication no. 4304923 the end rail profiles of the roller shutter and the curtain, respectively, are vertically positioned and the movement of the screening elements are guided in horizontal tracks. Furthermore, the roller shutter and the curtain are guided in planes which are displaced in a

mutually parallel manner, and subsequent mounting of this screening device in an existing window will, as a consequence of its rather bulky and complex construction, result in either extensive intervention in the wall structure or in an aesthetically unattractive appearance of the window and screening device.

According to the invention these drawbacks are eliminated in a simple way in that arresting means are provided for mutually independent retention of the screening elements in a number of arbitrary positions, and that the mutually facing sides of the two end rail profiles are designed to provide a mutual form-fit engagement throughout the length of said profiles.

By this design it is obtained that the two screening elements may be parked individually and fully independently in arbitrary inter-mediate positions such that the parts belonging to the roof light-admitting area of the window and covered by the screening elements may be adjusted correspondingly.

The screening device may be designed for manual operation in the way that the end rail profiles of the two screening elements for individual manual operation are connected each with a catching device, and that said side guide rail and end rail profiles are designed with cooperating friction arresting means for said mutually independent retention of the screening elements against an impact of force directed against the sash member to which the screening element in question is fastened.

The screening device may according to a further development of the invention also be designed for electrical operation in the way that the two screening elements are electrically operated, said end rail profile of each element being connected with a separate electric drive motor through a flexible connection device which provides said arresting means in which control circuits for the two drive motors are arranged for deactivating an activated drive motor when the end rail profiles enter into mutual abutment.

The invention will be explained in more detail with reference to the schematical drawing in which

Fig. 1 in perspective shows an embodiment of a roof window with a dual screening device according to the invention,

Figs. 2 and 3 show sectional views of the screening device in two different positions, and

Fig. 4 shows a sectional view of the guiding and arresting means to be used by manual operation of the screening device.

In the shown embodiment the dual screening device for a roof window with a sash consisting of horizontal sash members 4 and 9 and vertical sash members 16 and 17 comprises a roller blind 1 which is rolled up on a spring-biassed roller tube 2 mounted in a casing 3 which here as shown is fastened to the horizontal top section 4 of the window sash, whereas an end rail profile in the form of a bottom rail 5 is fastened at the free end

of the roller blind.

In order to secure the roller blind 1 in unrolled positions against the spring bias whose function is to keep the curtain cloth in a permanently tight stretch, guiding and arresting means are provided at the side sections of the sash, in the shown example in the form of side guiding rails 6 and 7 with a track 11, by which a friction end pin 12 may as shown in Fig. 4 by appropriate friction secure the roller blind in arbitrary unrolled positions.

The second screening element is in the shown embodiment constituted by a sunlight dimming, but translucent pleated blind 8, whose lower end is as shown fastened to the horizontal bottom section 9 of the window sash, whereas the free upper end is connected with an end guiding rail 10 guided by means of friction end pins 12 in connection with the rail 10 in the same track 11 in the guiding rails 6 and 7 as the roller blind 1, so that the pleated blind 8 may also be secured against the gravitational force in arbitrary unrolled positions, independently of the roller blind 1 being retained.

As shown in Figs. 2 and 3, the end rail profiles 5 and 10 are on their mutually facing sides designed to enter into a mutually form-adapted abutment, a bottom sealing 13 on the rail 5 being designed with an arch-shaped underside matching the top side of a rearwards projecting flange part 14 on the rail 10.

The dual screening device may also be designed in an inverse manner with a pleated blind above and a roller blind below.

In the shown embodiment, the screening device is designed for manual operation, both end rail profiles 5 and 10 being designed with a catching device, eg. as shown in Figs. 2 and 3 in the form of a continuous catching track 15.

However, the dual screening device may, as mentioned, alternatively be designed for electrical operation. Thus, for each of the screening elements 1 and 8 the accompanying profile 5 and 10, respectively, may through a cord drive of a design known per se eg. as known from the EP patent 015,043 be connected with a separate electric drive motor which, both for the roller blind 1 and for the pleated blind 8, may be positioned either in the casing 3 with the roller tube in or at the sash bottom section 9. As to operation and wiring, it is an advantage if the two drive motors are positioned in or at the same sash member.

To avoid malfunction, the control circuits for the two drive motors may in a known manner be connected with spring-biassed cord tension sensors which detect the cord tension in the two cord drives and switch off an activated drive motor when the cord slackens as a result of the profiles 5 and 10 entering into a mutual abutment.

## Claims

1. A screening device for a window with a substantially rectangular sash having first and second pairs of

sash members positioned opposite each other (4,9; 16,17), said first and second pairs of sash members extending in the width and height direction of the window, respectively, and of the type comprising a first screening element (1) with a breadth of a flexible screening material which in one end is rolled up on a roller tube (2) fastened to one sash member (4) in the first pair of sash members, and a second screening element (8) which in one end is fastened to the second sash member (9) in said first pair, where in connection with the second pair of sash members, guiding means are provided for guiding movement of the two screening elements in a direction parallel to said second pair of sash members, said guiding means at each sash member in said second pair comprising a side guide rail (6,7) with a common track (11) for the two screening elements, whereas both screening elements in the opposite end are connected with an end rail profile (5,10) extending in parallel relationship with said first pair of sash members, **characterized** in that arresting means are provided for mutually independent retention of the screening elements (1,8) in a number of arbitrary positions, and that the mutually facing sides (13,14) of the two end rail profiles (5,10) are designed to provide a mutual form-fit engagement throughout the length of said profiles.

2. A window screening device according to claim 1, **characterized** in that the first screening element has the form of siesta roller blind (1) rolled up with spring bias on said roller tube (2), whereas the further screening element (8) is a translucent element.

3. A window screening device according to claim 1 or 2, **characterized** in that the end rail profiles (5-10) of the two screening elements for individual manual operation are connected each with a catching device (15), and that said side guide rail (6,7) and end rail profiles (5,10) are designed with cooperating friction arresting means (11,12) for said mutually independent retention of the screening elements (1,8) against a load directed towards the sash member to which the screening element in question is fastened.

4. A window screening device according to claim 1 or 2, **characterized** that the two screening elements (1,8) are electrically operated, said end rail profile (5,10) of each element being connected with a separate electric drive motor through a flexible connection device which provides said arresting means in which control circuits of the two drive motors are arranged for deactivating an activated drive motor when the end rail profiles (5,10) enter into mutual abutment.

5. A window screening device according to claim 4,

**characterized** in that said flexible connection device is constituted by a cord drive, and that said control circuit for each electric drive motor is meant to be affected by a cord tension sensor.

### Patentansprüche

1. Abschirmvorrichtung für ein Fenster mit einem im wesentlichen rechteckigen Flügelrahmen umfassend einander gegenüberliegende erste und zweite Paare von Rahmenelementen (4, 9; 16, 17), welche erste und zweite Paare von Rahmenelementen in Richtung Breite bzw. Höhe des Fensters verlaufen, sowie ein erstes Abschirmelement (1) mit einer Bahn aus nachgiebigem Abschirmmaterial, das an einem Ende auf einem an das eine Rahmenelement (4) in dem ersten Paar von Rahmenelementen befestigten Rollrohr (2) aufgerollt ist, und ein zweites Abschirmelement (8), das an einem Ende an das zweite Rahmenelement (9) des ersten Paares befestigt ist, wobei in Verbindung mit dem zweiten Paar von Rahmenelementen Führungen für die Bewegung der beiden Abschirmelemente in einer Richtung parallel zum zweiten Paar von Rahmenelementen vorgesehen sind, welche Führungen in jedem Rahmenelement des zweiten Rahmenelementpaares eine seitliche Führungsschiene (6,7) mit einer gemeinsamen Spur (11) für die beiden Abschirmelemente aufweisen, wobei die Abschirmelemente an ihren gegenüberliegenden Ende jeweils mit einem parallel zum ersten Paar von Rahmenelementen verlaufenden Endschienenprofil (5, 10) verbunden sind, dadurch **gekennzeichnet**, dass Arretiermittel zum gegenseitig unabhängigen Festhalten der Abschirmelemente (1,8) in einer Anzahl beliebiger Stellungen vorgesehen sind, und dass die einander zuwendenden Seiten (13, 14) der beiden Endschienenprofile (5, 10) für gegenseitig formschlüssigen Eingriff entlang der ganzen Länge der Profile ausgestaltet sind.
2. Abschirmvorrichtung für ein Fenster nach Anspruch 1, dadurch **gekennzeichnet**, dass das erste Abschirmelement die Form eines unter Federvorspannung auf erwähntem Rollrohr (2) aufgerollten Verdunklungsrollos (1) aufweist, während das zusätzliche Abschirmelement (8) ein lichtdurchlässiges Element ist.
3. Abschirmvorrichtung für ein Fenster nach Anspruch 1 oder 2, dadurch **gekennzeichnet**, dass jedes Endschienenprofil (5, 10) der beiden Abschirmelemente eine für individuelle manuelle Betätigung vorgesehene Griffvorrichtung (15) aufweist, und dass die seitliche Führungsschiene (6,7) und die Endschienenprofile (5, 10) mit verknüpften Friktionssarretiermitteln (11, 12) versehen sind, zwecks

erwähntem unabhängigen Festhalten der Abschirmelemente (1, 8) gegenüber einer Belastung in Richtung des Rahmenelements, an welches das betreffende Abschirmelement befestigt ist.

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4. Abschirmvorrichtung für ein Fenster nach Anspruch 1 oder 2, dadurch **gekennzeichnet**, dass die zwei Abschirmelemente (1, 8) elektrisch bedienbar sind, wobei das Endschienenprofil (5, 10) jedes Elements an einen separaten elektrischen Antriebsmotor durch eine flexible Verbindungsvorrichtung angekoppelt ist, die erwähnte Arretiermittel ausmacht, wobei Steuerschaltungen der beiden Antriebsmotoren zum Abschalten eines angetriebenen Motors bei gegenseitiger Anlage der Endschienenprofile (5, 10) angeordnet sind.
5. Abschirmvorrichtung für ein Fenster nach Anspruch 4, dadurch **gekennzeichnet**, dass die flexible Verbindungsvorrichtung aus einem Drahtantrieb besteht, und dass die Steuerschaltung jedes elektrischen Antriebsmotors zur Beeinflussung durch einen Drahtspannungssensor vorgesehen ist.

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### Revendications

1. Dispositif d'obturation de fenêtre avec un ouvrant essentiellement rectangulaire présentant une première et deuxième paire d'éléments d'ouvrant, l'une opposée de l'autre (4, 9; 16, 17), lesdites première et deuxième paires d'ouvrant s'étendant dans la direction respectivement de la largeur et de la hauteur de la fenêtre, et du type comprenant un premier élément d'obturation (1) avec une bande d'une matière d'obturation flexible qui, à son bout, est enroulée sur un enrouleur (2) fixé à l'un élément d'ouvrant (4) dans la première paire des éléments d'ouvrant, et un deuxième élément d'obturation (8) qui, à son bout, est fixé au deuxième élément d'ouvrant (9) dans ladite première paire où, en relation avec la deuxième paire d'éléments d'ouvrant, des guides sont pourvus pour le mouvement de guidage des deux éléments d'obturation dans une direction parallèle à ladite paire des éléments d'ouvrant, lesdits guides à chaque élément d'ouvrant dans ladite deuxième paire comprenant une glissière latérale (6, 7) avec une coulisse commune (11) pour les deux éléments d'obturation, tandis que tous les deux éléments d'obturation dans le bout opposé sont reliés à un profilé extrême (5, 10) s'étendant en relation parallèle avec ladite première paire des éléments d'ouvrant, **caractérisé** en ce que des moyens d'arrêt sont pourvus pour retenir les éléments d'obturation (1, 8) indépendamment l'une de l'autre dans un nombre de positions arbitraires, et en ce que les côtés mutuellement opposés (13, 14) des deux profilés extrêmes (5, 10) sont conçus pour

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un engrenage étanche entre eux dans toute la longueur desdits profilés.

2. Dispositif d'obturation de fenêtre selon la revendication 1, **caractérisé** en ce que le premier élément d'obturation présente la forme d'un store d'occultation (1) enroulé sur ledit enrouleur (2) avec de la charge de ressort, tandis que l'élément d'obturation supplémentaire (8) est un élément translucide.
3. Dispositif d'obturation de fenêtre selon la revendication 1 ou 2, **caractérisé** en ce que les profilés extrêmes (5, 10) des deux éléments d'obturation sont reliés chacun à un dispositif de prise (15) pour la commande manuelle et individuelle, et que ladite glissière latérale (6, 7) et lesdits profilés extrêmes (5, 10) sont conçus avec des moyens d'arrêt de friction coopérants (11, 12) pour ladite rétention mutuelle et indépendante des éléments d'ouvrant (1, 8) contre une charge orientée vers l'élément d'ouvrant auquel l'élément d'obturation en question est fixé.
4. Dispositif d'obturation de fenêtre selon la revendication 1 ou 2, **caractérisé** en ce que les deux éléments d'obturation (1, 8) sont à commande électrique, ledit profilé extrême (5, 10) de chaque élément étant relié à un moteur d'entraînement électrique et séparé par un dispositif de liaison flexible qui comprend lesdits moyens d'arrêt où des circuits de commande des deux moteurs d'entraînement sont arrangés pour désactiver un moteur d'entraînement activé lorsque les profilés extrêmes (5, 10) entrent en appui mutuel.
5. Dispositif d'obturation de fenêtre selon la revendication 4, **caractérisé** en ce que ledit dispositif de liaison flexible est constitué d'une transmission par cordon, et que ledit circuit de commande de chaque moteur d'entraînement électrique est conçu pour être affecté par un capteur de tension de cordon.

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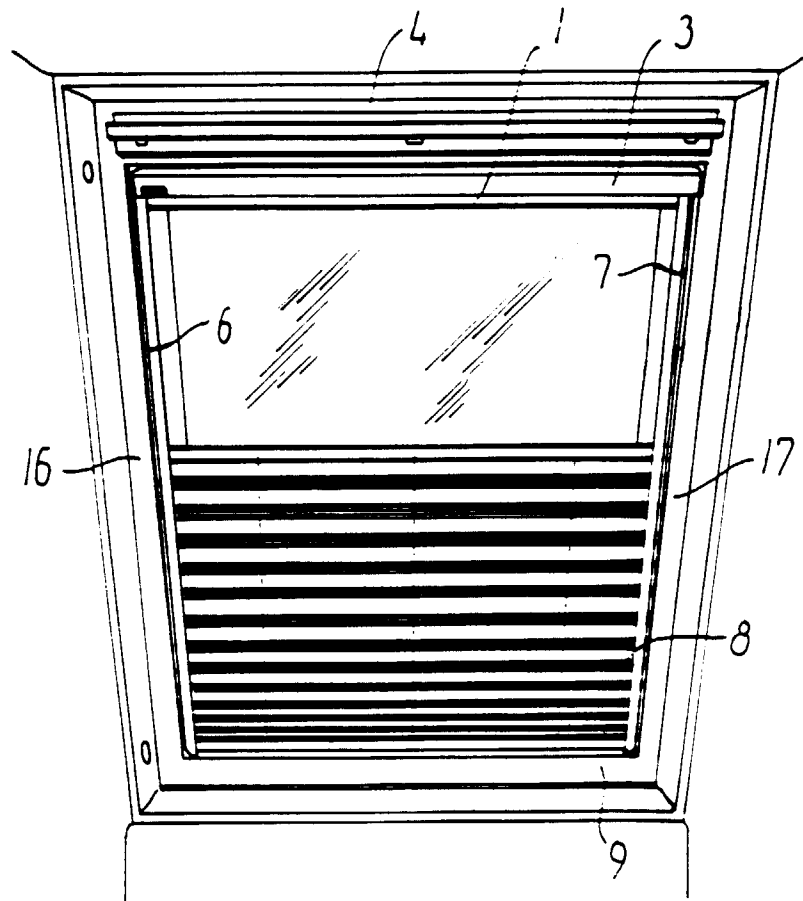


FIG. 1

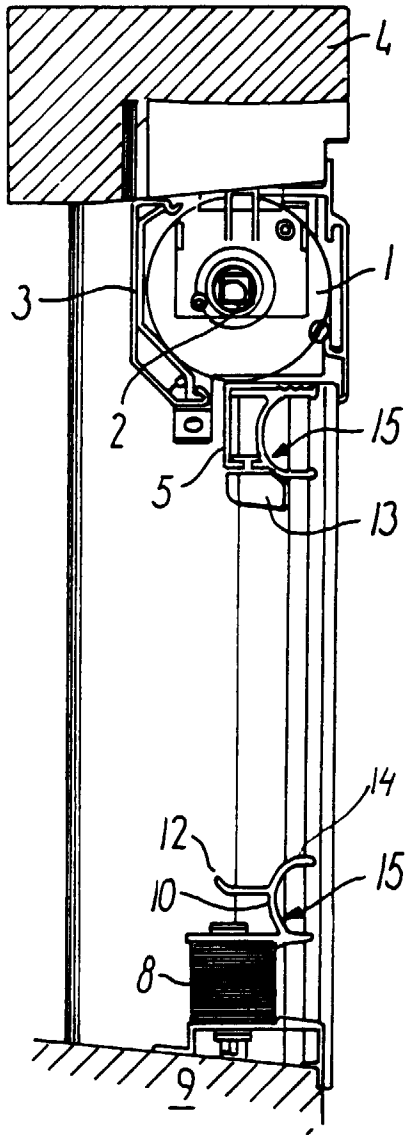


FIG. 2

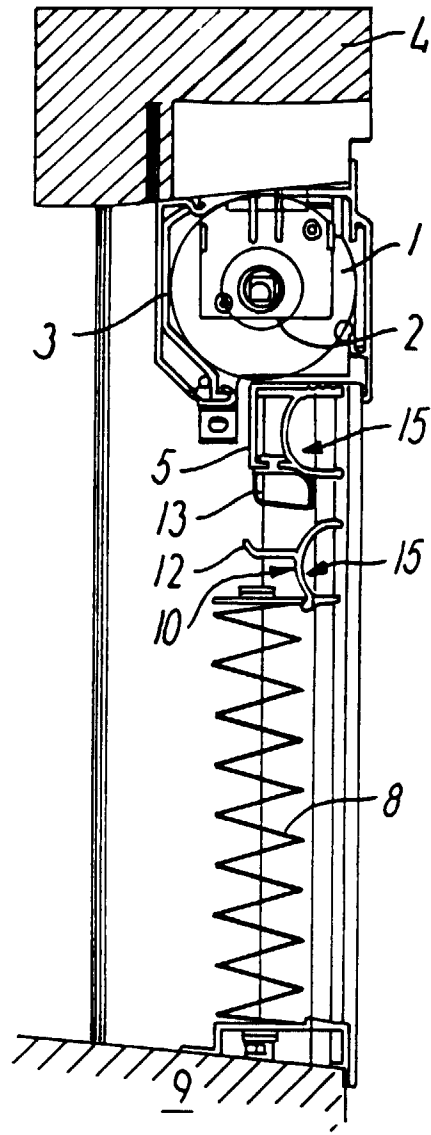


FIG. 3

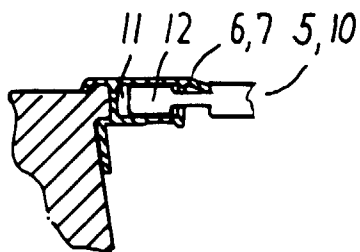


FIG. 4