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(54) **Energy saving blind**

(57) The invention relates to an energy saving blind (1), comprising a tube (5) being at its ends mounted in bearings (4), as well as a blind material (6) having one of its ends fastened to this tube and being rollable around the tube (5), which blind material, when being in an unrolled state, covers the whole window, to which the en-

ergy saving blind (1) is installed. The invention is characterized in that the bearings (4) are fastened to the outer side of the inner frame (2) of a conventional window openable to the inside so that the energy saving blind (1) is located in the space between two separately openable frames (2, 7) of the window.

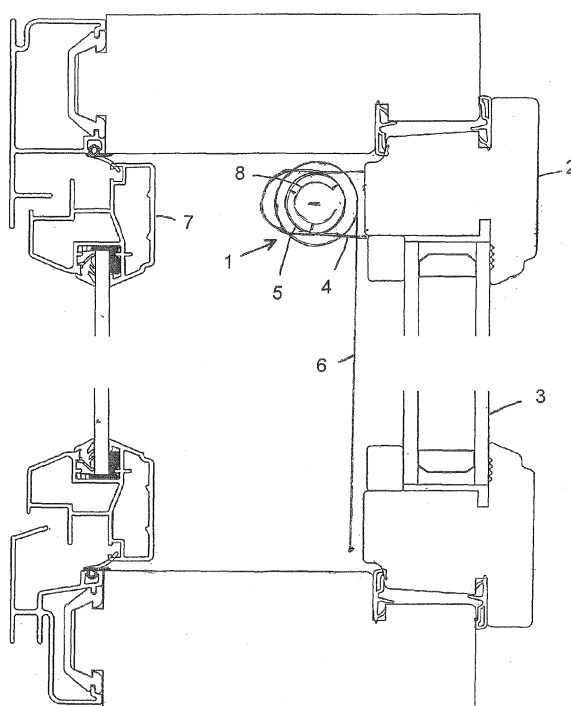


Fig. 1

Description

[0001] The present invention relates to an energy saving blind, comprising a tube being at its ends mounted in bearings, as well as a blind material having one of its ends fastened to this tube and being rollable around the tube, which blind material is intended in its unrolled state to cover the window to which the blind has been installed.

[0002] From the prior art conventional roller-blinds are known which are installed in bearings and fastened either to a wall above a window or to the inner surface of the frame of the inner window. The roller-blind of such kind certainly enables to prevent bright sunshine from entering a room and to provide a visual obstruction from the outside to the inside during the dark time but the roller-blind installed in this matter is not able to provide remarkable energy saving.

[0003] Likewise, solutions in which a roller-blind is installed to the front of a window outside a building are known. Such solutions certainly enable to prevent the sunshine and thus excess heat from entering the inside of a building, but such solutions are not suitable to hard weather conditions in the Nordic countries when the whole building is exposed to rain, wind, snow, freezing and air moisture. Furthermore, a roller-blind installed in said matter changes the facade of the building.

[0004] The object of the present invention is to provide such a roller-blind structure which, in addition to good properties of a conventional roller-blind, effectively prevents excess heat from entering the inside of a building in the summer as well as prevents heat from escaping from the building in the winter. This is achieved by means of an energy saving blind according to the invention, which is characterized in that bearings are fastened to the outer side of the inner frame of a conventional window openable to the inside so that said energy saving blind is located in the space between two separately openable frames of the window.

[0005] Being installed in this matter, the energy saving blind is in its uprolled state nearly invisible and forms in an unrolled state an effective shelter from the sunbeams already before their penetration through the glasses of the inner frame. At the same time it prevents the heat from escaping through the window in the winter. The energy saving blind according to the invention is well suitable to be installed to a window openable to the inside, having two frames and three glasses, the inner frame comprising a sealed glass element with a double glass, i.e. a so-called MSE-type window.

[0006] As a blind material darkening fabrics or micro perforated fabrics may be used. A further useful blind material is a so-called cellular fabric which as such has good thermal insulation properties.

[0007] The best thermal insulation property is achieved when the tube is mounted in the bearings so that the blind material is unrolled so close to the inner frame of the window as possible. With respect to the sunbeams a good thermal insulation property is also

achieved when the tube is mounted in bearings so that the blind material is unrolled as close to the outer frame of the window as possible.

[0008] According to a preferred embodiment, two parallel tubes are mounted in bearings, one of which locating close to the inner frame of the window, whereas the other is locating close to the outer frame of the window. Both tubes may have a similar blind material or different blind materials so that the outer blind material is primarily intended to prevent the bright light from entering the inside of a building, while the inner blind material is primarily designed to insulate heat and light. This solution enables to remarkably improve a heat transfer coefficient of the window when both blind materials have been drawn to the front of the window to protect from the sun and the coldness.

[0009] Depending on the control mechanism of the energy saving blind, its bearings may be mounted either close to the upper edge or the lower edge of the inner frame of the window or possibly close to one vertical side edge of the inner frame.

[0010] The energy saving blind may be either manually operated or motor-operated. When being manually operated, a coiler is stationary mounted to one end of the tube, to which coiler a lifting string is fastened to be rolled around the coiler, when the energy saving blind mounted to the upper part of the window is lowered down, whereby the blind material may be rolled again onto the tube by drawing the string. Preferably, the drawstring is then conducted out from the window structure to the room through a hole made in the inner frame.

[0011] According to another alternative, the position of the energy saving blind is controllable by means of a ball chain which is left between the windows so that the inner window has to be opened to be able to change the position of the energy saving blind.

[0012] According to a third alternative the energy saving blind is spring-actuated. In this solution a tube around which a blind material is rolled, is spring-actuated so that the spring tightens when the blind material is drawn down to cover the window by means of a drawstring fastened to the end of the blind material and preferably conducted to the room through a hole made in the opposite end of the inner frame. The blind can be held in its uprolled position, for instance by winding the drawstring around a knob arranged near to the hole. When the drawstring is released, the blind material will be rolled back around the tube by the force of the spring.

[0013] In a motor-operated energy saving blind, an electric motor is mounted inside the tube. The motor is either provided with its own power source or electric current is conducted to it from the outside. According to an embodiment a motor is electrically driven by a solar cell connected thereto. Preferably, the electric motor is controllable by a remote control, in which case no draught causing holes have to be made in the inner frame. In addition to a motor drive the tube may also be spring-loaded, the spring supporting the motor to roll the blind

material back around the tube.

[0014] To further improve the insulation or darkening properties of the energy saving blind, lateral guide bars may be mounted for the blind material at both sides of the inner frame. The edges of the blind material may also be provided with bristle bands.

[0015] In the following the invention is described with reference to an accompanying drawing wherein

figure 1 shows a schematic cross section of an example of an energy saving blind according to the invention, installed close to the glass surface of the inner frame of a so-called MSE-type window, and

figure 2 shows an example wherein the energy saving blind is installed close to the outer window.

[0016] The energy saving blind 1 shown in the figures is installed to a nowadays generally used MSE-type window which is a window openable to the inside and having two frames and three glasses, the inner frame 2 of which having a sealed double glazing glass element 3. The energy saving blind 1 comprises a tube 5 mounted with its ends in bearings 4 as well as a blind material 6, one end of which being fastened to this tube 5 and rollable around the tube, whereby the blind material covers in its unrolled state the whole window, to which said energy saving blind 1 has been installed. The bearings 4 of the energy saving blind according to the invention are fastened to the outer side of the inner frame 2 of the window so the energy saving blind is located in the space between two separately openable frames 2 and 7 of the window. In the figures the bearings 4 are fastened to the upper part of the inner frame 2 openable to the inside. Preferably, the tube 5 is mounted in bearings 4 so that the blind material 6 is unrolled as close to the inner frame 2 of the window as possible, as shown in figure 1, or close to the outer frame 7, as shown in figure 2.

[0017] In the figure 2 the bearings 4 are extended so that the tube 5 with the blind material to be unrolled is located so close to the outer frame 7 as possible. Thereby the blind material 6 is rolled onto the tube 5 so that it will be unrolled from that side of the tube 5 facing the outer frame 7.

[0018] To control the energy saving blind, an electric motor 8 is mounted to one end of the tube 5, the motor being provided with its own power source and preferably controllable with a remote control. In this installation, it is not necessary to make any holes leading through the inner frame which effectively prevents to avoid any draught.

Claims

1. An energy saving blind (1), comprising a tube (5) being at its ends mounted in bearings (4), as well as a blind material (6) having one of its ends fastened

to this tube and being rollable around the tube (5), which blind material, when being in an unrolled state, covers the whole window, to which the energy saving blind (1) is installed, **characterized in that** the bearings (4) are fastened to the outer side of the inner frame (2) of a conventional window openable to the inside so that the energy saving blind (1) is located in the space between two separately openable frames (2, 7) of the window.

2. The energy saving blind (1) according to claim 1, **characterized in that** the tube (5) is mounted in the bearings (4) so that the blind material (6) will be unrolled so close to the inner frame (2) of the window as possible.
3. The energy saving blind (1) according to claim 1, **characterized in that** the tube (5) is mounted in the bearings (4) so that the blind material (6) will be unrolled so close to the outer frame (7) of the window as possible.
4. The energy saving blind (1) according to claim 1, **characterized in that** two parallel tubes (5) are mounted in the bearings (4), one of which locating close to the inner frame (2) of the window and the other one close to the outer frame (7) of the window.
5. The energy saving blind (1) according to one of the preceding claims, **characterized in that** for rolling the blind material (6) the tube (5) is either manually operated or motor-operated.
6. The energy saving blind (1) according to claim 5, **characterized in that** a motor (8) being provided with its own power source and controllable by means of a remote control is arranged in one end of the tube (5).
7. The energy saving blind (1) according to any of the preceding claims, **characterized in that** the bearings (4) are fastened to the upper portion of the inner frame (2).
8. The energy saving blind (1) according to any of the claims 1 to 6, **characterized in that** the bearings (4) are fastened to the lower portion of the inner frame (2).
9. The energy saving blind (1) according to claim 4, **characterized in that** the tubes (5) are provided with different blind materials (6).
10. The energy saving blind (1) according to any of the preceding claims, **characterized in that** side guide bars for the blind material (6) are mounted at the inner frame (2) and the edges of the blind material (6) are provided with bristle bands.

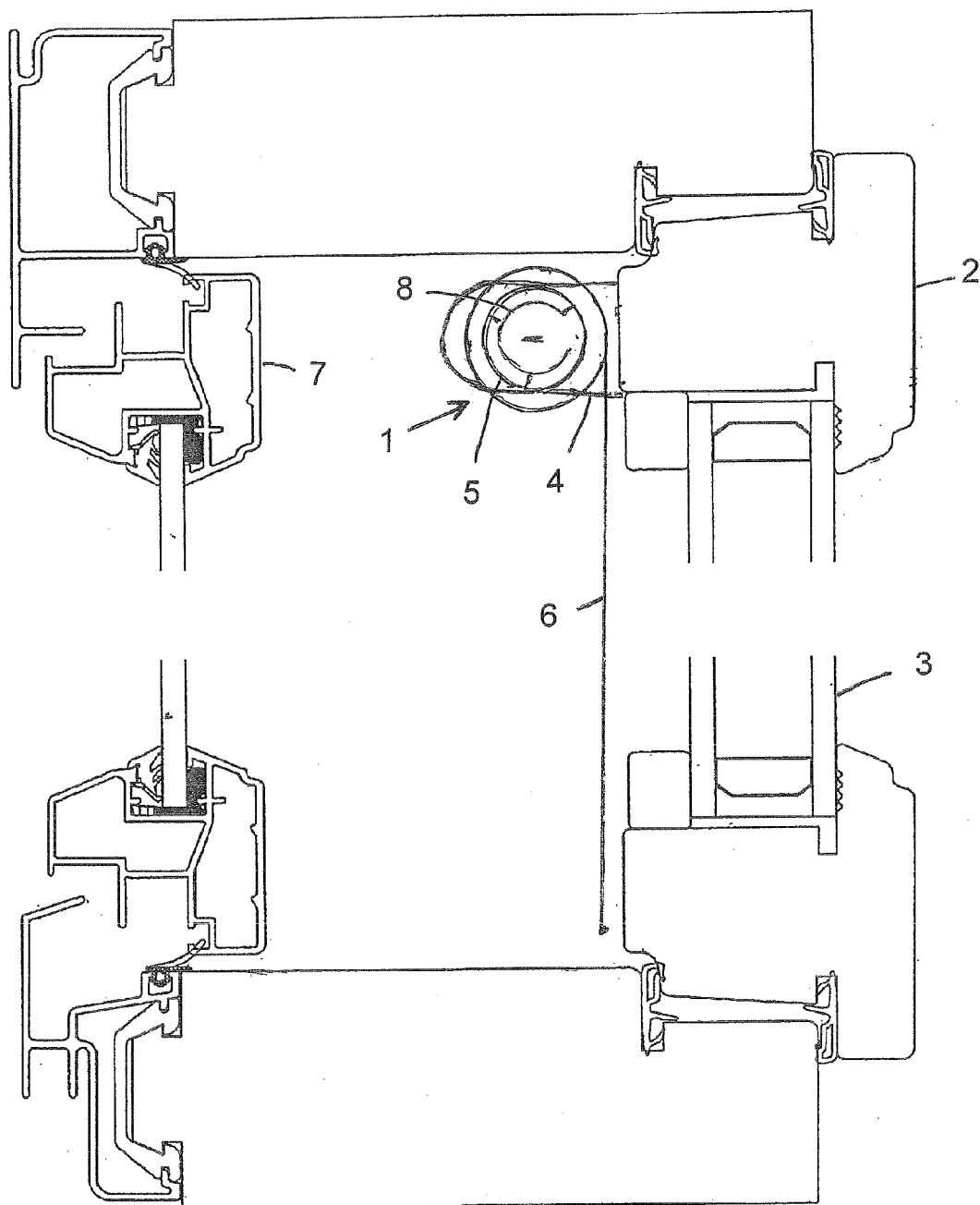


Fig. 1

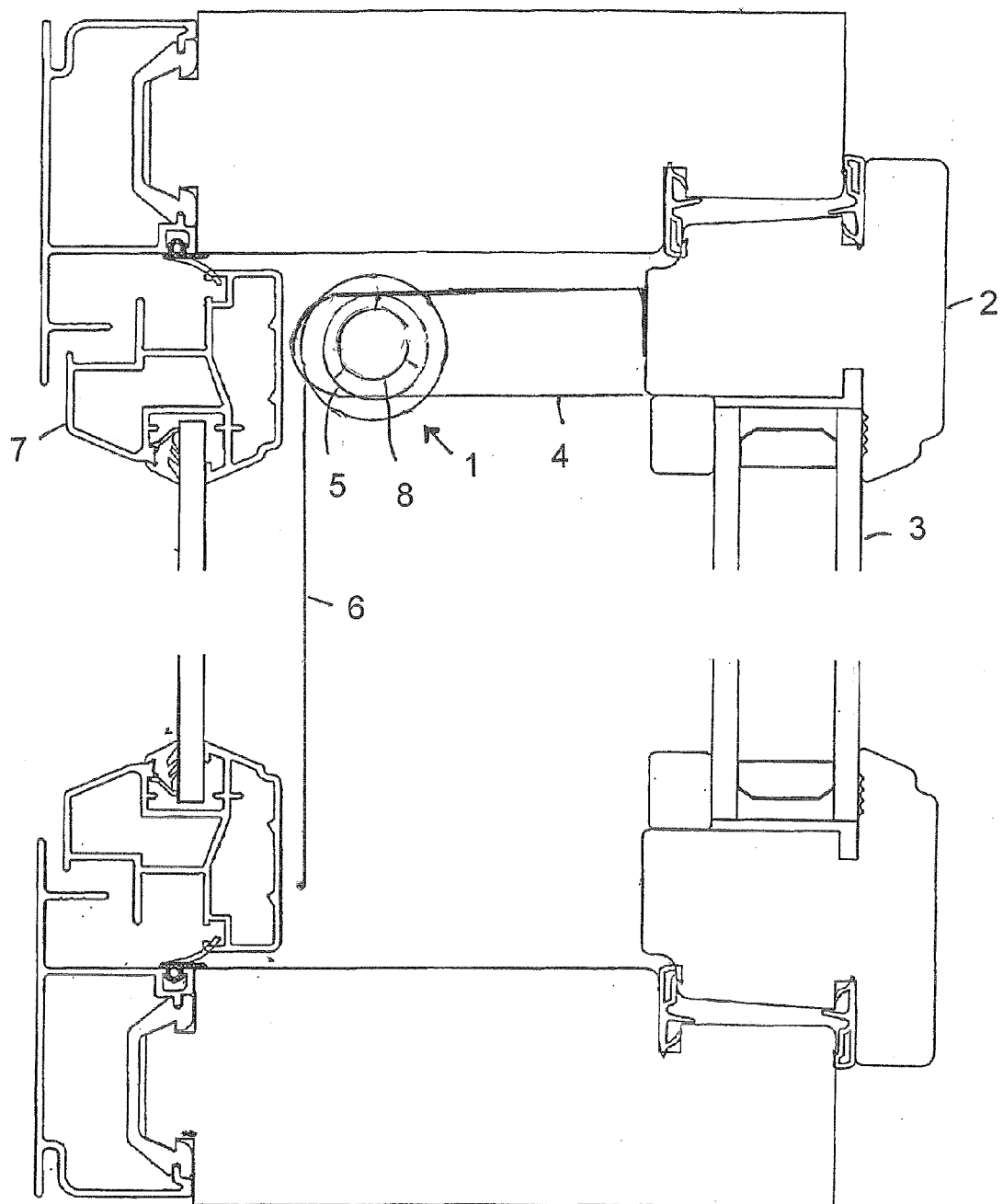


Fig. 2