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(54) **Device for selectively lowering and raising a pleated blind or a roller blind**

(57) A device for selectively lowering and raising a pleated or roller blind comprises: an elongate housing; a shaft mounted rotatably in this housing; winding rollers connected fixedly to this shaft for winding up and unwinding respective cords; control means for rotatingly driving the shaft selectively in the one or the other direction; guiding eyes which are added to the respective winding rollers and disposed fixedly relative to the housing and through which the cords extend, each of which guiding eyes is situated in the area of an end zone of the relevant winding roller; and fixation means for fastening the end of each cord to a winding roller, each of which fixation means is positioned at the other end zone of the relevant winding roller; wherein the wound-up part of each cord is slidable over the relevant winding roller.

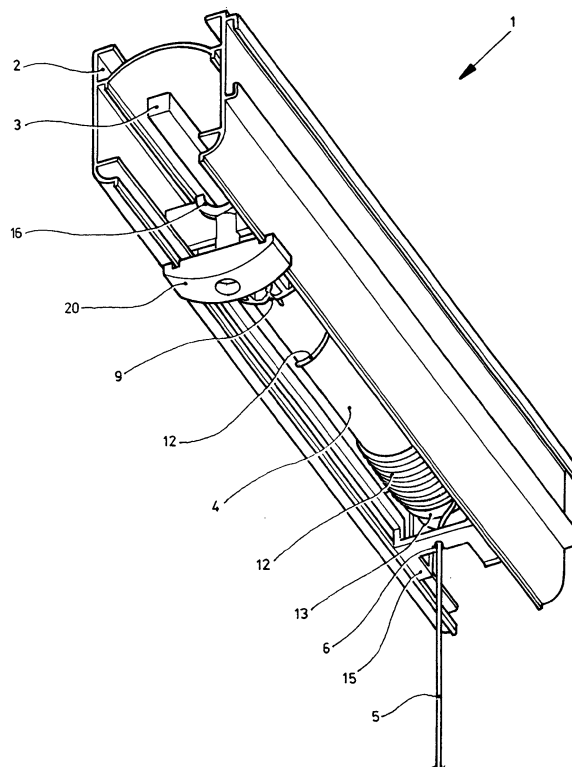


fig. 1

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Description

[0001] The invention relates to a device for selectively lowering and raising a pleated or roller blind. Such a device makes use of at least two cords, the free ends of which are connected to the bottom edge of the blind. With the winding up or unwinding the device achieves that the cords are shortened counter to the effect of gravity or are lengthened as a result of the effect of gravity such that the blind is raised or lowered.

[0002] The device is intended for coupling to for instance a pleated or roller blind which can be connected with its upper edge to the housing and must be connected with its lower edge, which is optionally provided with a stiffening, to the free ends of the cords, which pleated or roller blind has rows of first guide elements, for instance perforations, distributed over its height, through which the respective cords extend.

[0003] It is an object of the invention to embody a device of the stated type such that winding up and unwinding can take place with great ease and smoothness and without jolting.

[0004] It is a further object of the invention to embody a device of the stated type such that with great accuracy the cords have the same length at every position.

[0005] In respect of the above stated objectives the invention provides a device for selectively lowering and raising a pleated or roller blind, which device comprises:

an elongate housing which is adapted for fixing to a building construction, for instance to the upper horizontal part of a window frame;
a shaft mounted rotatably in this housing;
at least two rotation-symmetrical winding rollers connected fixedly to this shaft and disposed coaxially thereto for winding up and unwinding respective cords;
control means for rotatingly driving the shaft selectively in the one or the other direction and thus winding up or unwinding the cords onto or from their respective winding rollers;
guiding eyes which are added to the respective winding rollers and disposed fixedly relative to the housing and through which the cords extend, each of which guiding eyes is situated in the area of an end zone of the relevant winding roller; and
fixation means for fastening each cord relative to a respective winding roller, each of which fixation means is positioned at the other end zone of the relevant winding roller;

wherein the wound-up part of each cord is slidable over the relevant winding roller.

[0006] The guiding eyes are preferably registered with the guide elements such that the cords extend vertically substantially without deflection.

[0007] In a determined embodiment the invention has the special feature that each winding roller has at least

an outer surface consisting of a smooth plastic such as PTFE (polytetrafluoroethylene), PP (polypropylene), PE (polyethylene) or nylon. The surface of each winding roller is preferably smooth, thus ensuring said slidability of the cord over the winding roller. Through a suitable choice of the material of the cord, for instance a smooth material such as nylon, at least for the outside, it is possible to ensure that no appreciable wear of the winding rollers will occur, which could after all increase the coefficient of friction between the cords and the winding rollers.

[0008] Very good results are achieved with an embodiment wherein each winding roller substantially takes the form of a truncated cone.

[0009] The final embodiment can have the special feature that the half-apex angle of the truncated cone has a value of less than 10°.

[0010] It will often even suffice when the half-apex angle of the truncated cone has a value of less than 3°.

[0011] In a preferred embodiment the device according to the invention has the feature that a stop zone widening toward the outside connects to the said one end zone, which stop zone serves as soft stop for the wound-up part of the relevant cord.

[0012] The invention will now be elucidated with reference to the annexed drawings. In the drawings:

Fig. 1 shows a perspective view from the underside of a part of a device according to the invention; and Fig. 2 shows an exploded view of the same part of the device as in Fig. 1.

[0013] Fig. 1 and 2 show a part of a device 1 representative of the invention for selectively lowering and raising a pleated or roller blind.

[0014] Device 1 comprises: an elongate housing 2 which is adapted for fixing to a building construction, for instance to the upper horizontal part of a window frame; a shaft 3 mounted rotatably in this housing 2; at least two rotation-symmetrical winding rollers 4 connected fixedly to this shaft 3 and disposed coaxially thereto for winding up and unwinding respective cords 5; control means for rotatingly driving shaft 3 in the one or the other direction and thus winding up or unwinding cords 5 onto or from their respective winding rollers; second guiding eyes 6 which are added to the respective winding rollers 4 and disposed fixedly relative to the housing, which are registered with said first guiding eyes of the pleated or roller blind and through which cords 5 extend, each of which second guiding eyes is situated in the area of an end zone 7 of the relevant winding roller; and fixation means 8, 9, 10 for fastening the second end 11 of each cord 5 to a respective winding roller 4, each of which fixation means 8, 9, 10 is positioned at the other end zone of the relevant winding roller;

wherein the wound-up part 12 of each cord 5 is slidable over the relevant winding roller 4.

[0015] In this embodiment the elongate housing 2 is an aluminium extrusion profile.

[0016] In this embodiment the shaft 3 rotatable about its longitudinal axis takes a non-round form, i.e. is of square cross-section, and can thus be easily coupled, for locking against rotation, to each winding roller 4 by means of for instance locking screws, and supports an end flange unit 8 with a continuous hole 9 which is accessible via an opening 9 tapering inward from the outside for passage of the second end 11 of a relevant cord 5, which is provided on its end with a fixation block 10 fastened to this end 11 by means of a screw (not drawn). As Fig. 2 shows, fixation block 10 can be accommodated in a space 14 present in flange unit 8.

[0017] Winding rollers 4 can take a cylindrical form. They serve for winding up or unwinding cord 5 through suitable rotation when shaft 3 is rotated.

[0018] Not drawn are per se known control means for rotatable driving of the shaft. Such means can transmit a rotation from a more or less rigid control shaft to shaft 3 by means of a right-angled transmission, or can be embodied such that shaft 3 carries a toothed wheel-like ring into which can engage the balls of a ball chain that are mutually connected in flexible manner. Use can also be made of motor means.

[0019] Guiding eyes 6 are arranged in respective guide brackets 15 mounted in the profile. Fig. 2 in particular shows clearly the manner in which brackets 15 can be arranged in the aluminium extrusion profile 2 serving as housing. It will be apparent that, when displaced, cord 5 carries out a somewhat abrasive movement against the wall of guiding eye 6. Also in this respect a cord is recommended which has at least an outer surface consisting of a smooth plastic such as nylon. Nylon, perlon or similar materials have the advantage of ready availability, a general application as cord, and easy obtainability of any desired thickness and quality. In order to obtain a low coefficient of friction between cord 5 and bracket 15, this bracket 15 can likewise be manufactured from a suitable material such as PTFE, PP or PE. If desired, use could be made locally of a small nylon guide roller, in which case the walls of eye 6 undergo practically no friction load.

[0020] A bracket 15 serves as support bearing unit for winding roller 4. It thus comprises a cylindrical bearing surface 16 in which the narrowed end zone 17 of flange unit 8 can be rotatably supported. An identical narrowed end zone 18 is situated on the other side of winding roller 4. This is likewise supported by a bearing bush 19 forming part of bracket 15. Fixation to housing 2 takes place by means of a fixing bracket 20. It is pointed out for the sake of completeness that flange unit 8 is rotatable with shaft 3 as a unit together with winding roller 4.

[0021] In this embodiment each winding roller 4 consists of smooth nylon and each cord 5 consists of nylon of a normal trade quality.

[0022] Each winding roller takes the form of a truncated cone with a small apex angle of no more than a few degrees. The widest part is situated on the side of end zone 7. When winding roller 4 is rotated, the wound-up part 12

(see Fig. 1) of cord 5 can slide easily over the outer surface of winding roller 4. This enables a very easy and smooth winding and unwinding of cord 5, wherein the truncated cone-shaped stop zone 13 serving as soft stop (see Fig. 2) serves as run-on surface, against which the wound-up part 12 can push lightly and undergo an opposing force due to the relatively large apex angle of this stop zone 13, which force holds the wound-up part 12 in a desired area. In this embodiment the half-apex angle of soft stop 13 has a value of about 6°, while the active part of winding roller 4 has a half-apex angle of about 2°. It is noted that these are only indicative values to which the invention is not limited.

[0023] The frusto-conical soft stop 13 could optionally be replaced by a hard stop embodied as a right-angled flange. According to the invention however, the truncated cone shape is recommended in view of its smooth and jolt-free action.

Claims

1. Device (1) for selectively lowering and raising a pleated or roller blind, which device (1) comprises:

an elongate housing (2) which is adapted for fixing to a building construction, for instance to the upper horizontal part of a window frame;
a shaft (3) mounted rotatably in said housing (2);
at least two rotation-symmetrical winding rollers (4) connected fixedly to said shaft (3) and disposed coaxially thereto for winding up and unwinding respective cords (5);
control means for rotatingly driving the shaft (3) selectively in the one or the other direction and thus winding up or unwinding the cords (5) onto or from their respective winding rollers;
guiding eyes (6) which are added to the respective winding rollers (4) and disposed fixedly relative to the housing and through which the cords (5) extend, each of which guiding eyes is situated in the area of an end zone (7) of the relevant winding roller; and
fixation means (8, 9, 10) for fastening the second end (11) of each cord (5) relative to a respective winding roller (4), each of which fixation means (8, 9, 10) is positioned at the other end zone of the relevant winding roller;

wherein the wound-up part (12) of each cord (5) is slidable over the relevant winding roller (4).

2. Device (1) as claimed in claim 1, wherein each winding roller (4) has at least an outer surface consisting of a smooth plastic such as PTFE (polytetrafluoroethylene), PP (polypropylene), PE (polyethylene) or nylon.

3. Device (1) as claimed in claim 1, wherein each winding roller substantially takes the form of a truncated cone.
4. Device (1) as claimed in claim 3, wherein the half-apex angle of the truncated cone has a value of less than 10°. 5
5. Device (1) as claimed in claim 3, wherein the half-apex angle of the truncated cone has a value of less than 3°. 10
6. Device (1) as claimed in claim 1, wherein each cord (5) has at least an outer surface consisting of a smooth plastic such as nylon. 15
7. Device (1) as claimed in claim 1, wherein a stop zone (13) widening toward the outside connects to the said one end zone (7), which stop zone serves as soft stop for the wound-up part (12) of the relevant cord (5). 20

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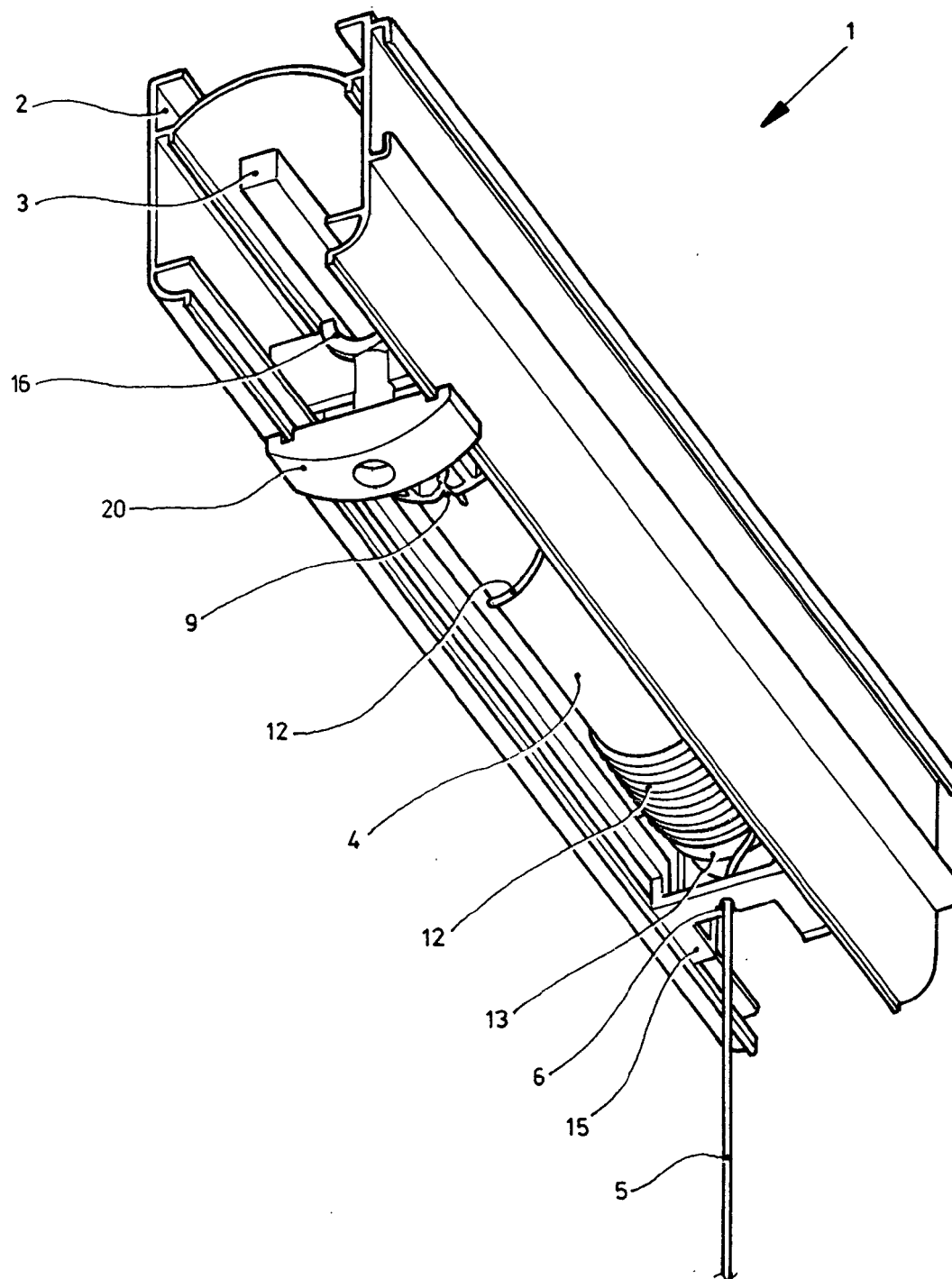


fig. 1

