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### (54) **Dual window covering with single operating means**

Doppelte Fensterabdeckung mit einer einzigen Bedienung

Couverture de fenêtre double avec un seul dispositif de commande

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**EP-A- 0 251 962** **US-A- 4 813 468**  
**US-A- 4 842 034** **US-A- 4 880 044**

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**EP 0 935 048 B1**

## Description

**[0001]** The invention relates to a window covering for covering or leaving wholly or partially clear at least one window as required according to the preamble of claim 1 and claim 5.

**[0002]** Such a window covering is disclosed in EP-A-0 251 962 and is also designated in the trade as day and night window covering, combi-pleat, dual window covering etc. The window covering can be applied as required with one or more tensioning cables for a hanging of the window covering which is other than vertical. The presence of an intermediate profile increases the possibilities of the present window covering compared to a more conventional window covering lacking an intermediate profile. The existing window coverings of the type stated in the preamble have separate drive mechanisms and operating means. Operation of the window covering is hereby relatively complex and susceptible to malfunction. An example hereof is that the intermediate profile has to be pulled up before the lower profile is pulled up because otherwise the operating cords of the intermediate profile have an excess length and will behave uncontrollably. Another drawback of the existing dual window covering is that the construction is relatively costly.

**[0003]** The present invention has for its object to provide a dual window covering not displaying these drawbacks. The invention provides for this purpose a window covering according to claim 1 or claim 5. Foldable screening means can herein be arranged between intermediate profile and lower profile and/or between housing and intermediate profile. Due to integration of the drive mechanisms and the presence of single operating means, operation of the dual window covering is very simple and foolproof. This means that incorrect operation of the window covering, with the associated risk of damage, is precluded. Automatic operation of the dual window covering hereby also becomes more obvious. In the case of a manually operated dual window covering single operating means have the advantage that they are less unattractive than two separate operating devices. Subject to the desired application it is possible to arrange different screening means. It is thus possible for instance to arrange a light-proof fabric between housing and intermediate profile and to arrange a light-transmitting fabric between intermediate profile and lower profile. A so-called day/night window covering is thus obtained. In addition to the use of pleated fabric, other screening means can also be applied in the window covering according to the invention, wherein slats or foil can for instance be envisaged. There is also the option of including two different types of window covering in the dual window covering, for instance a pleated fabric in combination with slats. Another option is to leave free the space between housing and intermediate profile and to only arrange screening means between intermediate profile and lower profile. A window covering can thus be

arranged which leaves clear the upper part of a window and the height of which is adjustable as desired.

**[0004]** With the winding covering according to claim 1, the winding shaft can be provided with cord reels onto which the cords engage. During closing of the window covering from the raised position, intermediate profile and lower profile will be moved downward together so that the screening means between housing and intermediate profile (if present) are unfolded. When the short winding cords have been fully unwound and the winding shaft is rotated further, the intermediate profile will be pulled up because the short winding cords will wind onto the winding shaft in opposite direction. The lower profile will remain in a stationary position. The long cords are unwound further and this additional cord length is required for displacement of the intermediate profile relative to the lower profile. The total distance from housing to intermediate profile via lower profile in any case becomes increasingly longer as the intermediate profile is raised. An end position is reached when the long winding cords are fully unwound or when the intermediate profile reaches the housing. The winding shaft can then no longer be rotated in the rotation direction applicable up to that point. Adjustment or full raising of the window covering is solely possible by rotation of the winding shaft in the only possible rotation direction still remaining. The end position in this second rotation direction is obtained when the lower profile and intermediate profile lie against the housing.

**[0005]** With the winding covering according to claim 5, the winding shaft can herein also be provided with cable reels onto which the cords engage. When winding cords are unwound from the raised position of the window covering, intermediate profile and lower profile will be moved downward together. When the winding cord is then wound up from a random position the intermediate profile will first be raised and only when this lies against the housing will the lower profile be raised. If intermediate profile and lower profile are moved apart and the winding cord is then extended, the intermediate profile will first displace until it lies against the lower profile, whereafter intermediate and lower profile are then moved downward together. The advantage of this embodiment compared to the above described preferred embodiment is that the intermediate profile can be raised at any random position of the lower profile. In the first described preferred embodiment the intermediate profile is only raised when the lower profile is situated in the extreme position. The advantage of the first embodiment compared to the second described embodiment is that the winding shaft has to make fewer revolutions for a corresponding displacement of the profiles.

**[0006]** In the preferred embodiment the operating means can be formed by an endless operating cord. It is very easily possible using the endless operating cord to cause the winding shaft to rotate in the desired direction. Instead of an endless operating cord it is possible to opt for another operating element, such as for in-

stance a rotating rod. Another option is to cause the winding shaft to rotate by motor, wherein operation of the motor can for instance take place remotely. The advantage in this embodiment is that only one motor is required as compared to the two motors in the dual window covering of the prior art. Since an operating motor must have relatively great power combined with a small volume, these motors are very costly. A dual window covering with only one operating motor is therefore considerably cheaper than a prior art motor-driven dual window covering.

**[0007]** The present invention will be further elucidated with reference to the non-limitative embodiments shown in the following figures. Herein:

Figure 1 shows a perspective cut-away view of a first embodiment of a window covering according to the invention in raised position,

Figure 2 shows a cut-away perspective view of the first embodiment of the window covering shown in figure 1 in a position where intermediate profile and lower profile are moved downward together,

Figure 3 shows a cut-away perspective view of the first embodiment of the window covering of figures 1 and 2 in a position where the lower profile is lowered and the intermediate profile is raised,

Figure 4 shows a cut-away perspective view of a second embodiment of the window covering according to the invention in a raised position,

Figure 5 is a cut-away perspective view of the second embodiment of the window covering shown in figure 4 in a position where intermediate profile and lower profile are moved downward together, and

Figure 6 is a cut-away perspective view of the second embodiment of the window covering of figures 4 and 5 in a position where the lower profile is lowered and the intermediate profile is raised.

**[0008]** Figure 1 shows a first embodiment of a window covering 1 with a housing 2 in which is accommodated a drive mechanism 3. Window covering 1 is further provided with an intermediate profile 4 and a lower profile 5. A pleated curtain 6 is arranged between housing 2 and intermediate profile 4 and a pleated curtain 7 is arranged between intermediate profile 4 and lower profile 5.

**[0009]** Drive mechanism 3 is provided with a winding shaft 8 on which are arranged cord reels 9, 10, 11, 12. An endless operating cord 13 likewise engages on winding shaft 8 so that winding shaft 8 is rotatable with the cord 13. The two outer cord reels 9, 12 are provided respectively with cords 14, 15 which are fixedly connected on one side to cord reels 9, 12. The other end of cords 14, 15 is connected by means of coupling elements 16, 17 to intermediate profile 4. Cords 14, 15 run from cord reels 9, 12 through intermediate profile 4 and through a passage in lower profile 5 before engaging on the underside of intermediate profile 4. The passage in lower

profile 5 consists of two openings 18 in lower profile 5.

**[0010]** The central cord reels 10, 11 are provided respectively with cords 19, 20 which engage directly onto the top part of intermediate profile 4.

**[0011]** Figure 2 shows the window covering 1 in a situation where intermediate profile 4 and lower profile 5 have been lowered so far that cords 19, 20 are fully unwound. The pleated curtain 6 lying between housing 2 and intermediate profile 4 is now fully lowered.

**[0012]** When winding shaft 8 is further rotated, the cords 19, 20 will wind in opposite direction onto cord reels 9, 10 while cords 14, 15 will unwind further. If the stated shaft rotation is continued a situation results as shown in figure 3.

**[0013]** Figure 3 shows the window covering 1 in a position in which the rotation of winding shaft 8 has been continued so far that winding cords 14, 15 are fully unwound, this being clearly visible from the reels 9, 12 with no cord wound around them. Continued rotation of winding shaft 8 has resulted in the cords 19, 20 being fully rewound onto cord reels 10, 11. Intermediate profile 4 is therefore fully raised such that pleated curtain 6 is folded up again.

**[0014]** Unwinding of cords 14, 15 and winding up of cords 19, 20 has resulted in the position of lower profile 5 not being changed relative to the position shown in figure 2. The additional length of cords 14, 15 is taken up by the length required for the distance between intermediate profile 4 and lower profile 5. Pleated curtain 7 is thus wholly unfolded in this position. It will be apparent that the rotation of winding shaft 8 can also be stopped in a position lying between the positions shown in figures 2 and 3. A part of the window surface for covering will herein be screened by pleated curtain 6 while the remaining part is screened by pleated curtain 7. Many effects can thus be created as desired.

**[0015]** For the sake of completeness it is noted here that this application refers repeatedly to cords 14, 15, 19, 20, while cables, ropes, belts or similar elements may also be understood herein. The term winding cord must therefore also be interpreted in a broad sense.

**[0016]** Figure 4 shows a window covering 21 wherein the components corresponding with the components as shown in figures 1-3 are designated with the same reference numerals. Winding shaft 8 is provided with only two cord reels 22, 23 onto which are wound cords 24, 25 respectively. As seen from cord reels 22, 23 winding cords 24, 25 are first carried through intermediate profile 4 and then fed through housing 2, whereafter the cords finally engage on lower profile 5.

**[0017]** In the position shown in figure 5 winding cords 24, 25 are fully unwound. Intermediate profile 4 and lower profile 5 are hereby both situated in the lowest position, whereby the upper pleated curtain 6 is fully unfolded.

**[0018]** When cords 24, 25 are subsequently wound onto cord reels 22, 23 a position results for instance as shown in figure 6. Cords 24, 25 choose the path of least

resistance and will first raise intermediate profile 5 to a position in which the upper pleated curtain 6 is fully folded up. The lower pleated curtain 7 will hereby come to lie in an unfolded state. When winding shaft 8 is further rotated from the position shown in this figure, the lower profile 5 will then also be raised.

## Claims

1. Window covering (1) for covering or leaving wholly or partially clear at least one window as required, comprising:

- a housing (2) which can be mounted in stationary manner,
- a lower profile (5) displaceable relative to the housing (2),
- an intermediate profile (4) located between housing (2) and lower profile (5) and displaceable relative to the lower profile (5),
- drive mechanisms accommodated in the housing (2) for displacing intermediate profile (4) and lower profile (5), wherein the drive mechanisms are integrated and provided with single operating means (13) with which both intermediate profile (4) and lower profile (5) can be controlled,

### characterized in that

the integrated drive mechanism comprises a central rotatable winding shaft (8) onto which engage winding cords (14, 15, 19, 20) of two different lengths, the shorter (19, 20) of which engage directly onto the intermediate profile (4) and the longer (14, 15) of which engage on the intermediate profile (4) but, between the points of engagement on the intermediate profile (4) and the winding shaft (8), also engage displaceably on passages connected to the lower profile (5).

2. Window covering (1) as claimed in claim 1, wherein foldable screening means (6) are arranged between intermediate profile (4) and lower profile (5).

3. Window covering (1) as claimed in claim 1 or 2, wherein foldable screening means (6) are arranged between housing (2) and intermediate profile (4).

4. Window covering (1) as claimed in claim 1, wherein the winding shaft (8) is provided with cord reels (9, 10, 11, 12) on which the cords engage (14, 15, 19, 20).

5. Window covering (21) for covering or leaving wholly or partially clear at least one window as required, comprising:

- a housing (2) which can be mounted in stationary manner,
- a lower profile (5) displaceable relative to the housing (2),
- an intermediate profile (4) located between housing (2) and lower profile (5) and displaceable relative to the lower profile (5),
- drive mechanisms accommodated in the housing (2) for displacing intermediate profile (4) and lower profile (5), wherein the drive mechanisms are integrated and provided with single operating means (13) with which both intermediate profile (4) and lower profile (5) can be controlled,

### characterized in that

the integrated drive mechanism comprises a central rotatable winding shaft (8) onto which engage winding cords (24, 25) which also engage onto the lower profile (5) and, between the points of engagement onto respectively the winding shaft (8) and the lower profile (5), the cords (24, 25) respectively engage displaceably on a passage connected to the intermediate profile (4) and a passage connected to the housing (2) whereby the cords (24, 25) descending from the winding shaft (8) engage displaceably firstly on the passage connected to the intermediate profile (4) and secondly to the passage connected to the housing (2).

6. Window covering (21) as claimed in claim 5, wherein the winding shaft (8) is provided with cable reels (22, 23) onto which the cords (24, 25) engage.

7. Window covering (21) as claimed in any of the foregoing claims, wherein the operating means (13) are formed by an endless operating cord.

## Patentansprüche

1. Fensterabdeckung (1) zum vollständigen oder teilweisen Abdecken oder Freilassen wenigstens eines Fensters, wie gewünscht, mit:

- einem Gehäuse (2), das in stationärer Weise montiert werden kann,
- einem unteren Profil (5), das relativ zum Gehäuse (2) verstellbar ist,
- einem mittleren Profil (4), das zwischen dem Gehäuse (2) und dem unteren Profil (5) liegt und relativ zum unteren Profil (5) verstellbar ist,
- Antriebsmechanismen, die in dem Gehäuse (2) zum Verstellen des mittleren Profils (4) und des unteren Profils (5) aufgenommen sind, wobei die Antriebsmechanismen mit einzelnen Betätigungsmitteln (13) integriert und versehen sind, mit welchen sowohl das mittlere Profil (4)

als auch das untere Profil (5) gesteuert werden können,

**dadurch gekennzeichnet, dass**

der integrierte Antriebsmechanismus eine zentrale, drehbare Aufwickelwelle (8) hat, auf die Aufwickelschnüre (14, 15, 19, 20) mit zwei unterschiedlichen Längen, eingreifen, wobei die kürzere (19, 20) direkt auf das mittlere Profil (4) eingreift und die längere (14, 15) auf das mittlere Profil (4), jedoch zwischen den Eingriffspunkten auf dem mittleren Profil (4) und der Aufwickelwelle (8) eingreift, auch verstellbar auf an das untere Profil (5) angeschlossene Passagen eingreift.

2. Fensterabdeckung (1) nach Anspruch 1, wobei zwischen dem mittleren Profil (4) und dem unteren Profil (5) faltbare Abschirmmittel (6) angeordnet sind.

3. Fensterabdeckung (1) nach Anspruch 1 oder 2, wobei zwischen dem Gehäuse (2) und dem mittleren Profil (4) faltbare Abschirmmittel (6) angeordnet sind.

4. Fensterabdeckung (1) nach Anspruch 1, wobei die Aufwickelwelle (8) mit Schnurrollen (9, 10, 11, 12) versehen ist, auf die die Schnüre (14, 15, 19, 20) eingreifen.

5. Fensterabdeckung (21) zum vollständigen oder teilweisen Abdecken oder Freilassen wenigstens eines Fensters wie gewünscht, mit:

- einem Gehäuse (2), das in stationärer Weise montiert werden kann,
- einem unteren Profil (5), das relativ zu dem Gehäuse (2) verstellbar ist,
- einem mittleren Profil (4), das zwischen dem Gehäuse (2) und dem unteren Profil (5) liegt und relativ zu dem unteren Profil (5) verstellbar ist,
- Antriebsmechanismen, die in dem Gehäuse (2) aufgenommen sind, um das mittlere Profil (4) und das untere Profil (5) zu verstellen, wobei die Antriebsmechanismen mit einem einzigen Betätigungsmittel (13) integriert und versehen sind, mit welchem sowohl das mittlere Profil (4) als auch das untere Profil (5) gesteuert werden können,

**dadurch gekennzeichnet, dass**

der integrierte Antriebsmechanismus eine zentrale, drehbare Aufwickelwelle (8) aufweist, auf welche Aufwickelschnüre (24, 25) eingreifen, die auch auf das untere Profil (5) eingreifen, und die Schnüre (24, 25) zwischen den Einwirkungspunkten auf die Aufwickelwelle (8) bzw. das untere Profil (5) jeweils verstellbar auf eine Passage, die mit dem mitt-

leren Profil (4) verbunden ist und eine Passage die mit dem Gehäuse (2) verbunden ist, eingreifen, wodurch die Schnüre (24, 25) von der Aufwickelwelle (8) nach unten gehend verstellbar zuerst auf die Passage eingreifen, die an das mittlere Profil (4) angeschlossen ist und zweitens auf die Passage eingreifen, die an das Gehäuse (2) angeschlossen ist.

6. Fensterabdeckung (21) nach Anspruch 5, wobei die Aufwickelwelle (8) mit Kabelrollen (22, 23) versehen ist, auf welche die Schnüre (24, 25) eingreifen.

7. Fensterabdeckung (21) nach einem der vorstehenden Ansprüche, wobei die Betätigungsmittel (13) durch eine endlos arbeitende Schnur gebildet sind.

**Revendications**

1. Couverture de fenêtre (1) permettant de couvrir ou de laisser complètement ou partiellement libre au moins une fenêtre comme nécessaire, comprenant :

- un logement (2) qui peut être installé de manière stationnaire ;
- un profilé inférieur (5) mobile par rapport au logement (2) ;
- un profilé intermédiaire (4) situé entre le logement (2) et le profilé inférieur (5) et mobile par rapport au profilé inférieur (5) ;
- des mécanismes d'entraînement contenus dans le logement (2) pour déplacer le profilé intermédiaire (4) et le profilé inférieur (5), dans laquelle les mécanismes d'entraînement sont intégrés et munis de moyens d'actionnement uniques (13) avec lesquels il est possible de commander à la fois le profilé intermédiaire (4) et le profilé inférieur (5) ;

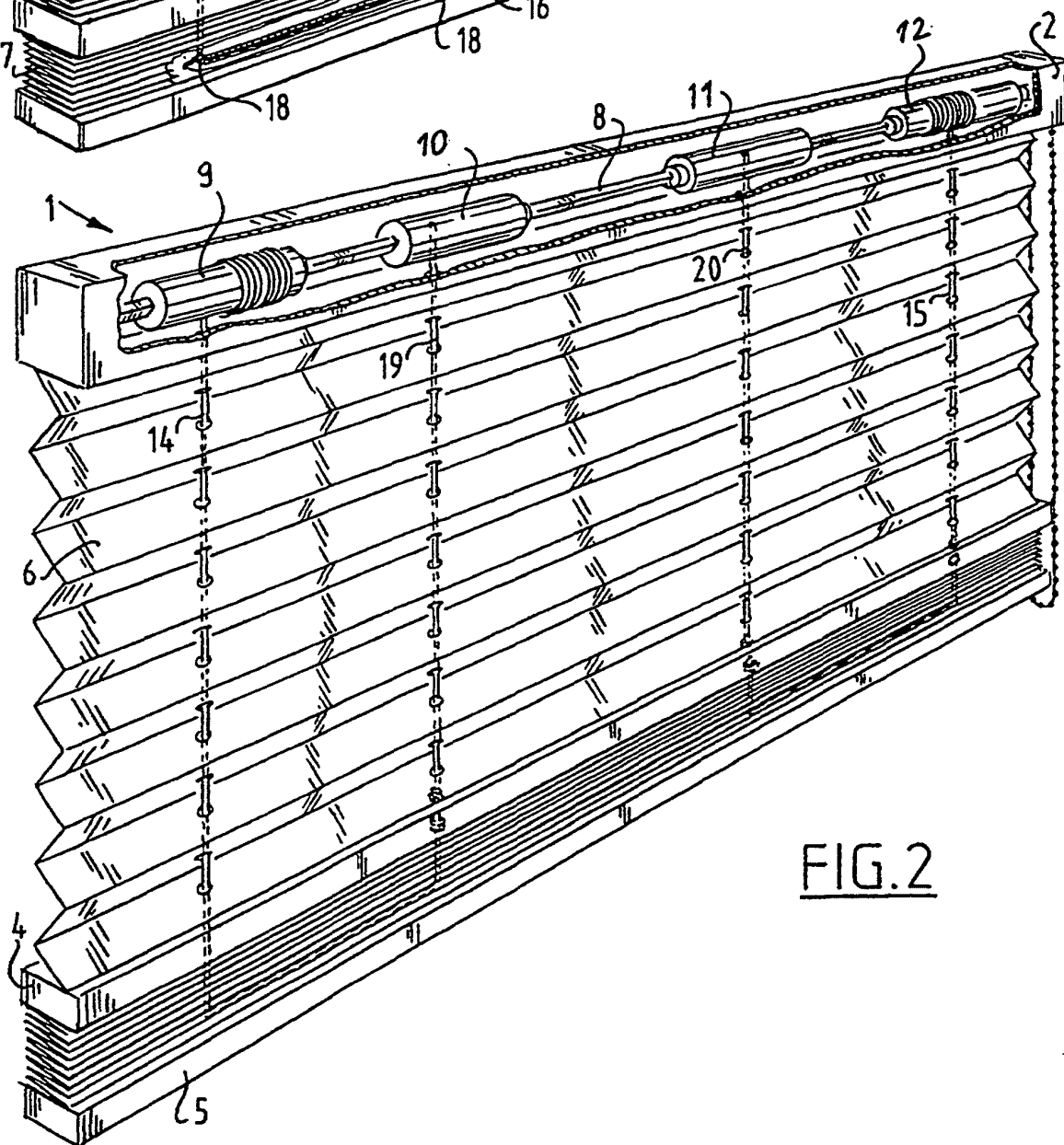
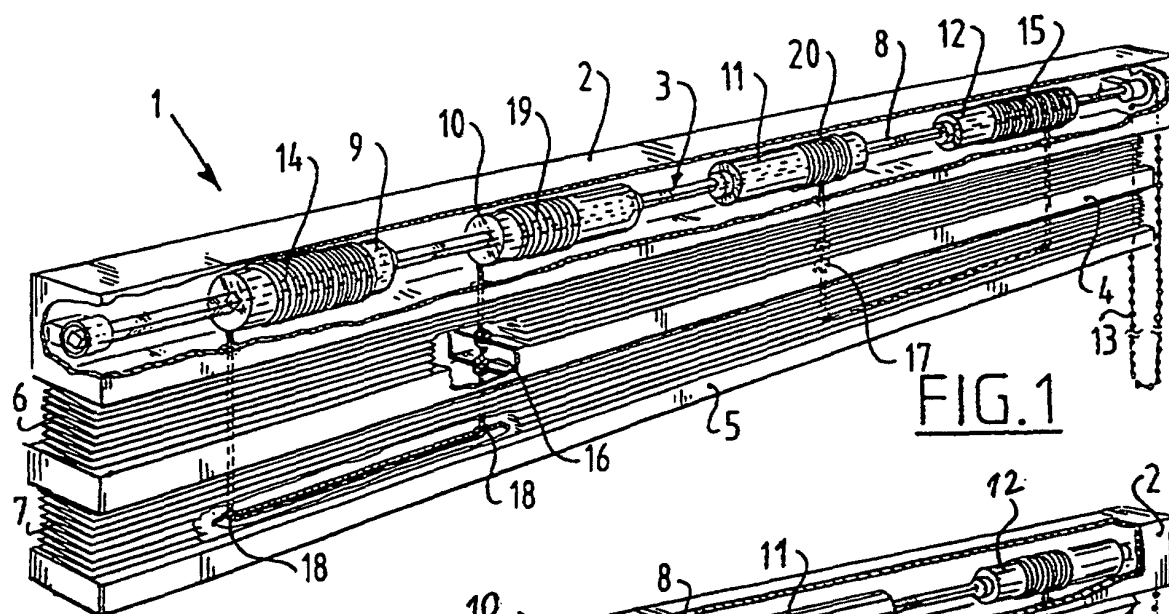
**caractérisée en ce que** le mécanisme d'entraînement intégré comprend un axe d'enroulement rotatif central (8) sur lequel s'engagent des cordons d'enroulement (14, 15, 19, 20) de deux longueurs différentes, dont les plus courts (19, 20) s'engagent directement sur le profilé intermédiaire (4) et dont les plus longs (14, 15) s'engagent sur le profilé intermédiaire (4), mais entre les points d'engagement sur le profilé intermédiaire (4) et l'axe d'enroulement (8), s'engagent également de façon mobile sur des passages connectés au profilé inférieur (5).

2. Couverture de fenêtre (1) selon la revendication 1, dans laquelle des moyens de voilage pliants (6) sont agencés entre le profilé intermédiaire (4) et le profilé inférieur (5).

3. Couverture de fenêtre (1) selon la revendication 1

ou 2, dans lequel des moyens de voilage pliants (6) sont agencés entre le logement (2) et le profilé intermédiaire (4).

4. Couverture de fenêtre (1) selon la revendication 1, dans laquelle l'axe d'enroulement (8) est muni de dévidoirs de cordon (9, 10, 11, 12) sur lesquelles s'engagent les cordons (14, 15, 19, 20). 5
  
5. Couverture de fenêtre (21) permettant de couvrir ou de laisser complètement ou partiellement libre au moins une fenêtre comme nécessaire, comprenant : 10
  - un logement (2) qui peut être installé de manière stationnaire ; 15
  - un profilé inférieur (5) mobile par rapport au logement (2) ;
  - un profilé intermédiaire (4) situé entre le logement (2) et le profilé inférieur (5) et mobile par rapport au profilé inférieur (5) ; 20
  - des mécanismes d'entraînement contenus dans le logement (2) pour déplacer le profilé intermédiaire (4) et le profilé inférieur (5), dans laquelle les mécanismes d'entraînement sont intégrés et munis de moyens d'actionnement uniques (13) qui permettent de commander à la fois le profilé intermédiaire (4) et le profilé inférieur (5) ; 25
  
- 30
- caractérisée en ce que**
- le mécanisme d'entraînement intégré comprend un axe d'enroulement rotatif central (8) sur lequel s'engagent des cordons d'enroulement (24, 25) qui s'engagent également sur le profilé inférieur (5), et entre les points d'engagement sur respectivement l'axe d'enroulement (8) et le profilé inférieur (5), les cordons (24, 25) s'engagent respectivement de façon mobile sur un passage raccordé au profilé intermédiaire (4) et un passage raccordé au logement (2), de manière à ce que les cordons (24, 25) descendant de l'axe d'enroulement (8) s'engagent de façon mobile premièrement sur le passage raccordé au profilé intermédiaire (4) et deuxièmement sur le passage raccordé au logement (2). 35 40 45
  
6. Couverture de fenêtre (21) selon la revendication 5, dans laquelle l'axe d'enroulement (8) est muni de dévidoirs de câble (22, 23) sur lesquels s'engagent les cordons (24, 25). 50
  
7. Couverture de fenêtre (21) selon l'une quelconque des revendications précédentes, dans laquelle les moyens d'actionnement (13) sont formés par un cordon d'actionnement sans fin. 55



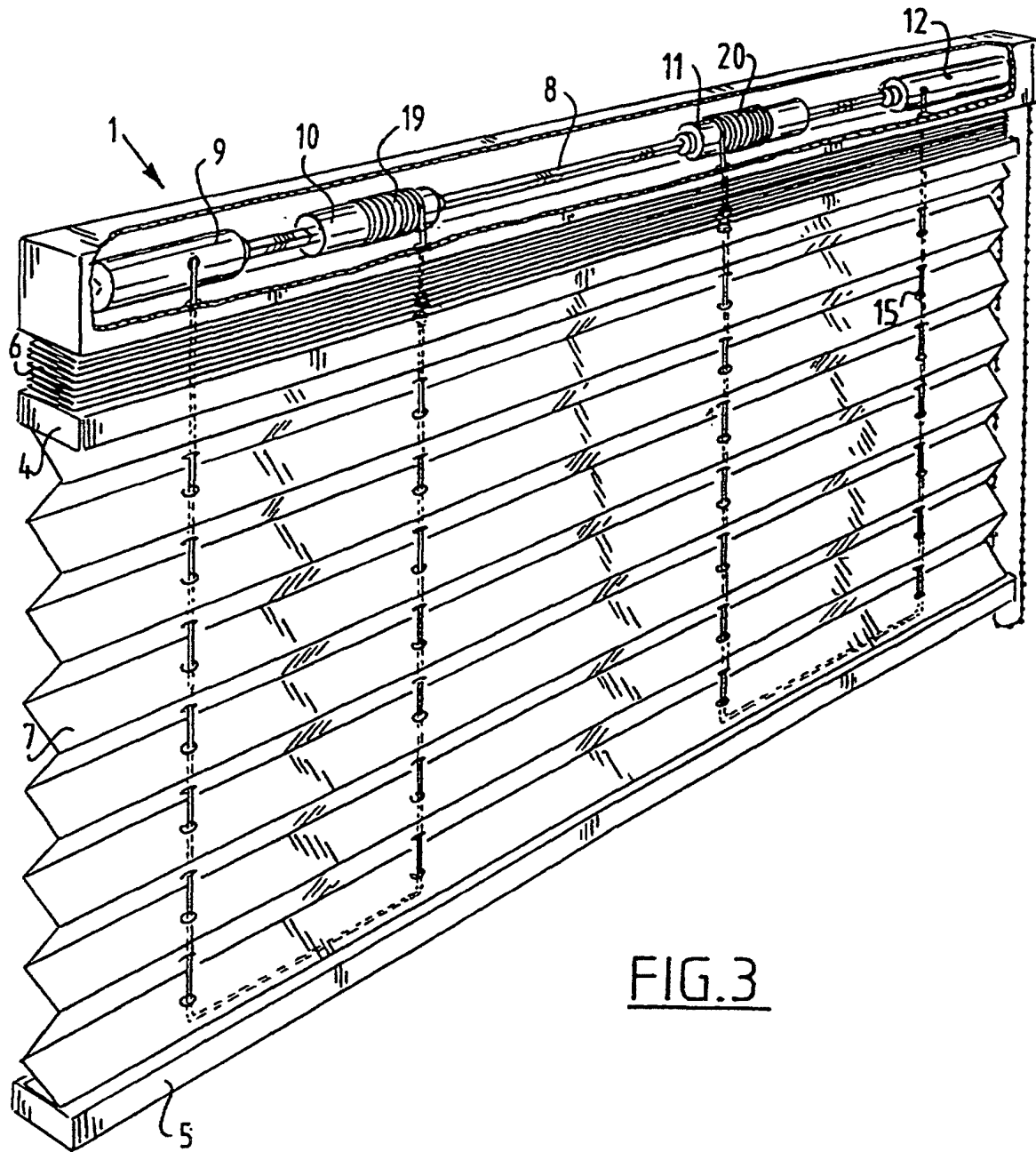
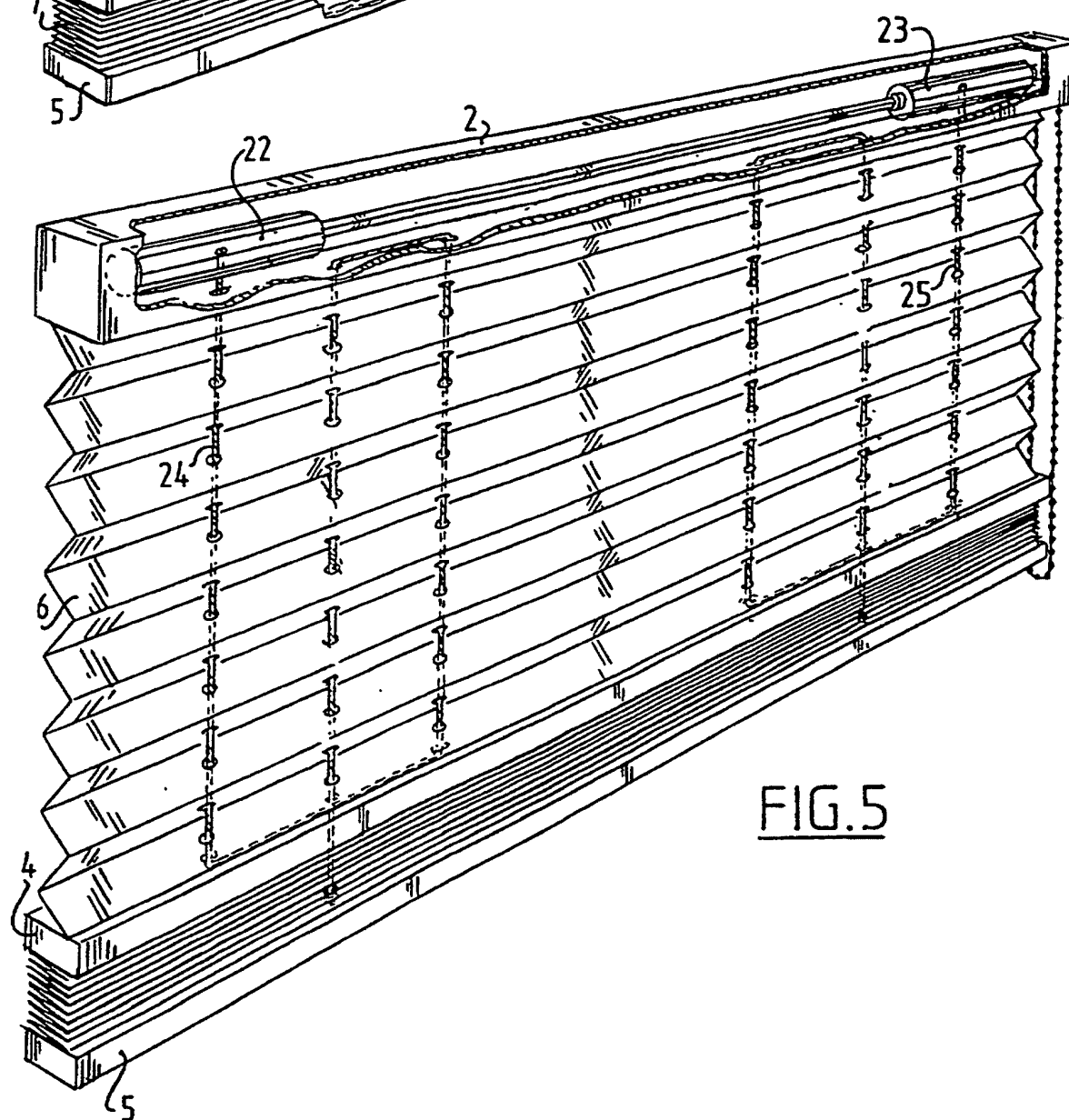
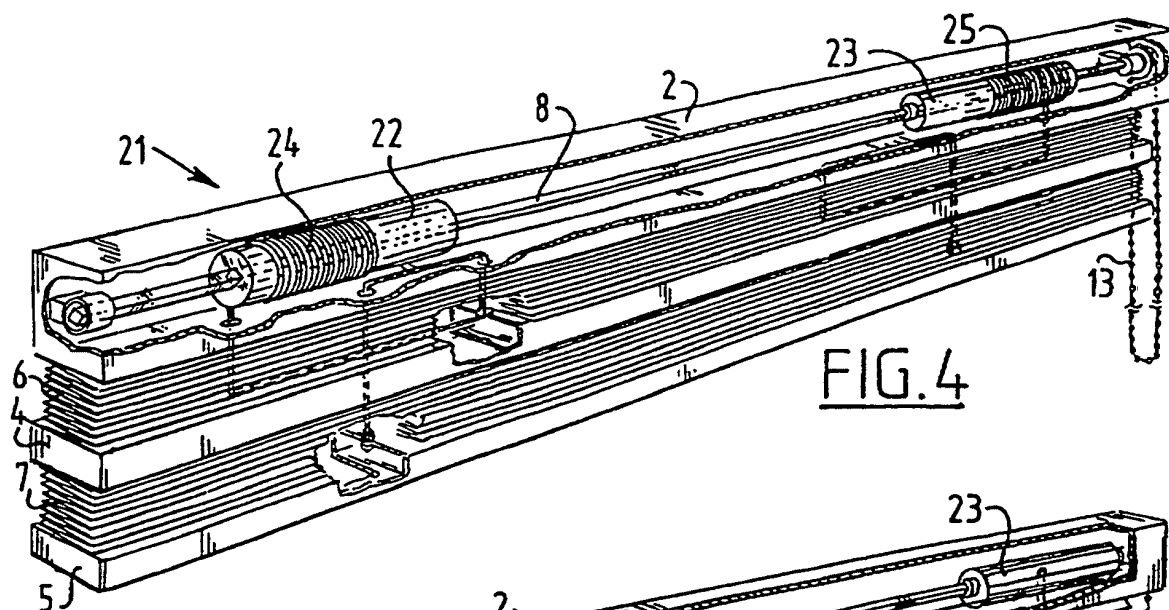


FIG.3



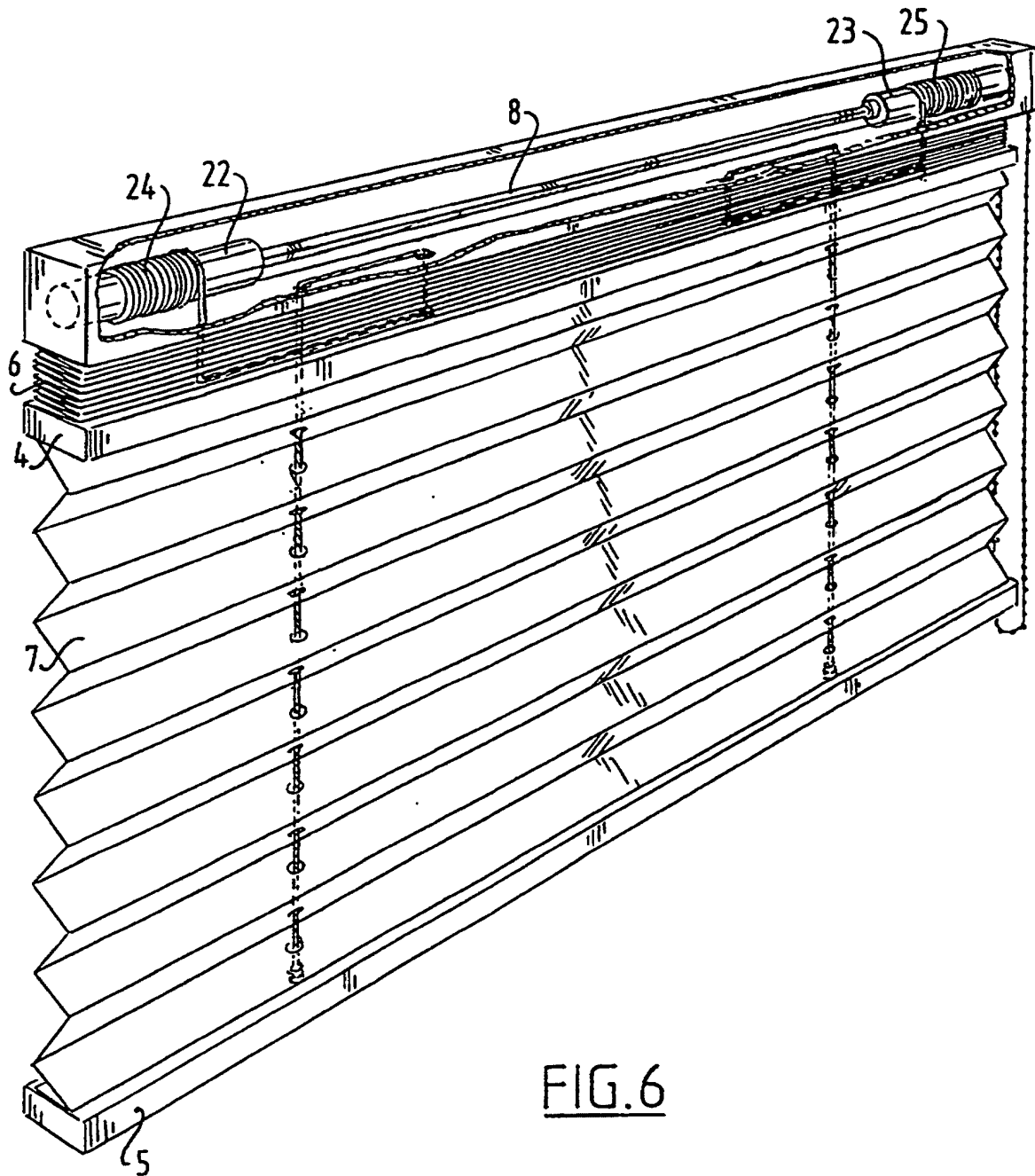


FIG. 6