



(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification :
10.06.92 Bulletin 92/24

(51) Int. Cl.⁵ : **E06B 9/307**

(21) Application number : **89312388.5**

(22) Date of filing : **29.11.89**

(54) **Drive mechanism for venetian blind.**

(30) Priority : **06.12.88 GB 8828403**

(43) Date of publication of application :
13.06.90 Bulletin 90/24

(45) Publication of the grant of the patent :
10.06.92 Bulletin 92/24

(84) Designated Contracting States :
AT DE ES FR IT NL SE

(56) References cited :
DE-A- 3 636 855
GB-A- 670 935

(73) Proprietor : **HUNTER DOUGLAS INDUSTRIES B.V.**
Piekstraat 2
NL-3071 EL Rotterdam (NL)

(72) Inventor : **Oskam, Herman**
West Vlieterdijk 64a
NL-2855 AK Vlist (NL)

(74) Representative : **Allen, William Guy Fairfax et al**
J.A. KEMP & CO. 14 South Square Gray's Inn
London WC1R 5EU (GB)

EP 0 372 803 B1

Note : Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

The present invention relates to venetian blinds and drive mechanisms therefor.

Traditionally venetian blinds are formed with a headrail, usually of channel cross-section, in which is mounted an operating mechanism controlled by a longitudinally extending drive shaft. This drive shaft may be used to raise and lower the slats of the blind and/or may be used to tilt the slats. The drive shaft is itself driven usually via a gear box which may be controlled, for example, by a bead chain or by a rotatable wand.

In relatively narrow venetian blinds using reduced dimensioned headrails, gear boxes to reduce the effort in raising and lowering the blind are not readily available, so it has been customary with such small headrail systems to revert to a crank rod to operate the winding mechanism. One problem with such a crank drive is that it looks inappropriate on a blind having such slender dimensions and it would be very desirable to be able to use a ball cord or a ball chain as an operating element.

It is now proposed, according to the present invention, to provide a venetian blind including a head rail, a drive shaft for raising and lowering the slats of the blind, a drive gear mechanism for rotating said drive shaft, said drive gear mechanism comprising a housing, means to mount the housing on the exterior of a venetian blind head rail, the rear face of the housing being engageable with said head rail, a manually operable drive member mounted for rotation in said housing, a driven shaft extending rearwardly outwardly of said housing and an epicyclic gear train operatively connected between said drive member and said driven shaft and a direction changing gear train, such as a bevel gear train, connecting the driven shaft of the drive mechanism to the drive shaft of the venetian blind.

The epicyclic gear train can be made very compact and can give a substantial gear reduction to make operation of the blind easy.

In a preferred construction the housing has formed internally thereof, the ring gear of an epicyclic gear train. A further improvement in the efficiency can be achieved by the planet carrier of the epicyclic gear train including a bearing for the drive member which may be in the form of a bead chain pulley. With this arrangement, the bead chain pulley and the driven shaft both rotate in the same rotational sense, while the difference in rotational speed is less than it would have been if the chain wheel had been journalled on a fixed shaft. In this way certain friction losses are thus reduced.

If desired, the direction changing gear train, such as the bevel gear train, can include a braking means for holding the blind in a raised position.

In order that the present invention may more readily be understood, the following description is given,

merely by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a perspective view of one embodiment of venetian blind according to the present invention;

Figure 2 is an enlarged cross-section to the headrail of the blind showing the drive gear mechanism; and

Figure 3 is a schematic exploded view of the drive gear mechanism of Figure 2.

Referring first to Figure 1, there is illustrated therein one embodiment of venetian blind according to the present invention, including a headrail 10, a bottom rail 12 supported by lift cords 14 and a plurality of slats 16 supported by ladder means 18. Conventional raising and tilting mechanisms 20 are provided for raising and lowering the bottom rail 12 and for lifting the slats 16; these mechanisms are shown provided with a cover 22 and are themselves rotated by a drive shaft 24.

Rotation of the drive shaft 24 is effected by a drive mechanism 26. The drive shaft includes a central screwthreaded spindle 28 carrying end stops 30 and 32 and a translating nut element 34, the elements 28 to 34 being utilized to control the amount of raising and lowering of the blind in a manner with which the present invention is not concerned.

If reference is now made to Figures 2 and 3, the drive mechanism, indicated with the general reference numeral 26, includes a housing 36 having, adjacent its lower rear edge, a rearwardly extending finger 38 and adjacent its upper rear edge a rearwardly extending hook 40. The hook 40 can be engaged over the bead 42 of the front flange 44 of the headrail 10 and the finger 38 can be secured by a self tapping screw 46 engaged in a hole in the web portion 48 of the headrail 10 to hold the housing 36 on the front of the headrail 10. An inner surface of the housing 36 is formed with a ring gear 50 of an epicyclic gear train indicated by the general reference numeral 52. This gear train includes a planet carrier 54 mounted for rotation on a stub shaft 56. The planet carrier has three rotatably mounted planet gears 58 thereon, which mesh with the ring gear 50 and also mesh with a sun gear 60. This sun gear itself is journalled on a driven shaft 62 integral with the planet carrier 54. The sun gear is formed integrally with a bead chain pulley 64 carrying a manually operable bead chain 66, (Figure 1).

As can be seen again in Figures 2 and 3, the driven shaft 62 has a hexagonal end portion 68 engageable in a direction changing gear train 70 as seen in Figure 1.

It will be appreciated, therefore, that in use, operation of the bead chain will cause the pulley 64 to rotate, this rotating the sun gear 60. The planet gears 58 will be rotated thereby, because they mesh with the ring gear 50, the planet carrier 54 and therefore the

driven shaft 62, 68, will rotate, thereby rotating the drive shaft 24 via the bevel gear train 70.

Such a structure is very compact and provides an efficient gear reduction ratio, for example of 3 to 1, so that the blind can be operated in an easy manner.

Claims

1. A venetian blind including a head rail (10), a drive shaft (24) for raising and lowering the slats (16) of the blind, a drive gear mechanism (26) for rotating said drive shaft, characterised in that said drive gear mechanism (26) comprises a housing (36), means (38 to 46) to mount the housing (26) on the exterior of a venetian blind head rail (10), the rear face of the housing being engageable with said head rail, a manually operable drive member (64) mounted for rotation in said housing (36), a driven shaft (62) extending rearwardly outwardly of said housing (36) and an epicyclic gear train (52) operatively connected between said drive member (64) and said driven shaft (62) and a direction changing gear train (70), such as a bevel gear train, connecting the driven shaft (62) of the drive gear mechanism (26) to the drive shaft (24) of the venetian blind.

2. A venetian blind according to claim 1, characterised in that said housing (36) has formed internally thereof the ring gear (50) of the epicyclic gear train (52).

3. A venetian blind according to claim 1 or 2, characterised in that a planet carrier (54) of the epicyclic gear train (52) includes a bearing (62) for the drive member (64).

4. A venetian blind according to claim 1, 2 or 3, characterised in that the drive member (64) comprises a bead chain pulley.

5. A venetian blind according to any preceding claim, characterised in that the housing (36) includes rearwardly extending hook-shaped elements (40) adapted to hook onto the venetian blind head rail (10), so that the housing (36) is located in front of the head-rail.

6. A venetian blind according to any preceding claim, characterised in that said drive shaft is a combined drive shaft (24) for raising and lowering and for tilting the slats (16) of the blind.

Patentansprüche

1. Jalousie mit einer Kopfschiene (10), einer Antriebswelle (24) zum Anheben und Absenken der Lamellen (16) der Jalousie, einem Antriebsgetriebemechanismus (26) zum Drehen der Antriebswelle, dadurch gekennzeichnet, daß der Antriebsgetriebemechanismus (26) ein Gehäuse (36), Einrichtungen (38 bis 46) zur Montage des Gehäuses (26) an der

Außenseite einer Jalousiekopfschiene (10), wobei die Rückseite des Gehäuses mit der Kopfschiene in Eingriff bringbar ist, ein manuell betätigbares Antriebselement (64), das drehbar im Gehäuse (36) montiert ist, eine angetriebene Welle (62), die sich vom Gehäuse (36) nach hinten und außen erstreckt, und ein Epizykloidengetriebe (52), das zwischen dem Antriebselement (64) und der angetriebenen Welle (62) angeordnet und mit diesen in Wirkverbindung steht, sowie ein Richtungsänderungsgetriebe (70), beispielsweise ein Kegelradgetriebe, umfaßt, das die angetriebene Welle (62) des Antriebsgetriebemechanismus (26) mit der Antriebswelle (24) der Jalousie verbindet.

2. Jalousie nach Anspruch 1, dadurch gekennzeichnet, daß im Gehäuse (36) das Ringrad (50) des Epizykloidengetriebes (52) ausgebildet ist.

3. Jalousie nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß ein Planetenträger (54) des Epizykloidengetriebes (52) ein Lager (62) für das Antriebselement (64) enthält.

4. Jalousie nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, daß das Antriebselement (64) eine Kugelnkettenscheibe umfaßt.

5. Jalousie nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das Gehäuse (36) sich nach hinten erstreckende hakenförmige Elemente (40) aufweist, die an die Kopfschiene (10) der Jalousie hakbar sind, so daß das Gehäuse (36) vor der Kopfschiene angeordnet ist.

6. Jalousie nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die Antriebswelle eine kombinierte Antriebswelle (24) zum Anheben und Absenken und zum Verschwenken der Lamellen (16) der Jalousie ist.

Revendications

1. Store vénitien comprenant un rail de tête (10), un arbre d'entraînement (24) pour élever et abaisser les lattes (16) du store, un mécanisme à engrenages d'entraînement (26) pour faire tourner ledit arbre d'entraînement, caractérisé en ce que ce mécanisme à engrenages d'entraînement (26) comprend un logement (36), des moyens (38 à 46) pour monter le logement (26) sur l'extérieur du rail de tête (10) du store vénitien, la face arrière du logement pouvant être en contact avec ledit rail de tête, un élément d'entraînement pouvant être actionné manuellement (64) monté pour tourner dans ledit logement (36), un arbre mené (62) s'étendant vers l'arrière à l'extérieur dudit logement (36) et un train d'engrenages planétaires (52) monté fonctionnellement entre ledit élément d'entraînement (64) et l'arbre mené (62) et un train d'engrenages de changement de direction (70), tel qu'un train d'engrenages coniques reliant l'arbre mené (62) du mécanisme à engrenages d'entraînement (26) à

l'arbre d'entraînement (24) du store vénitien.

2. Store vénitien selon la revendication 1, caractérisé en ce que dans ledit logement (36) est formée intérieurement la couronne (50) du train d'engrenages planétaires (52).

5

3. Store vénitien selon la revendication 1 ou 2, caractérisé en ce qu'un porte-pignons satellites (54) du train d'engrenages planétaires (52) comprend un palier (62) pour l'élément d'entraînement (64).

4. Store vénitien selon la revendication 1, 2 ou 3, caractérisé en ce que l'élément d'entraînement (64) comprend une poulie pour chaîne à perles.

10

5. Store vénitien selon l'une quelconque des revendications précédentes, caractérisé en ce que le logement (36) comprend des éléments (40) en forme de crochet, s'étendant vers l'arrière, destinés à s'accrocher sur le rail de tête (10) du store vénitien, de sorte que le logement (36) se trouve à l'avant du rail de tête.

15

6. Store vénitien selon l'une quelconque des revendications précédentes, caractérisé en ce que ledit arbre d'entraînement est un arbre d'entraînement combiné (24) pour élever et abaisser et pour incliner les lattes (16) du store.

20

25

30

35

40

45

50

55



