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(71) Applicant: HUNTER DOUGLAS INDUSTRIES B.V.
Piekstraat 2
NL-3071 EL Rotterdam(NL)

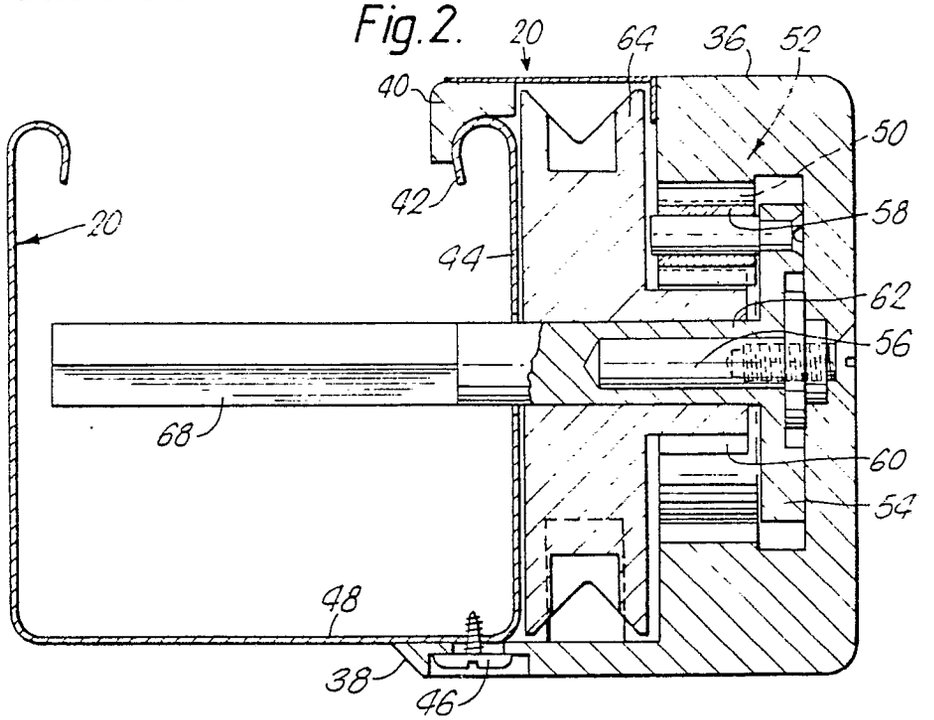
(72) Inventor: Oskam, Herman
West Vlisterdijk 64a
NL-2855 AK Vlist(NL)

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

(54) Drive mechanism for venetian blind.

(57) A venetian blind and drive mechanism (52) therefore, in which the drive shaft (68) passes through the headrail (20) of a blind, is rotated by an epicyclic gear train (50) which may be mounted on the front of the venetian blind headrail.

Fig.2.



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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 headrail.

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.

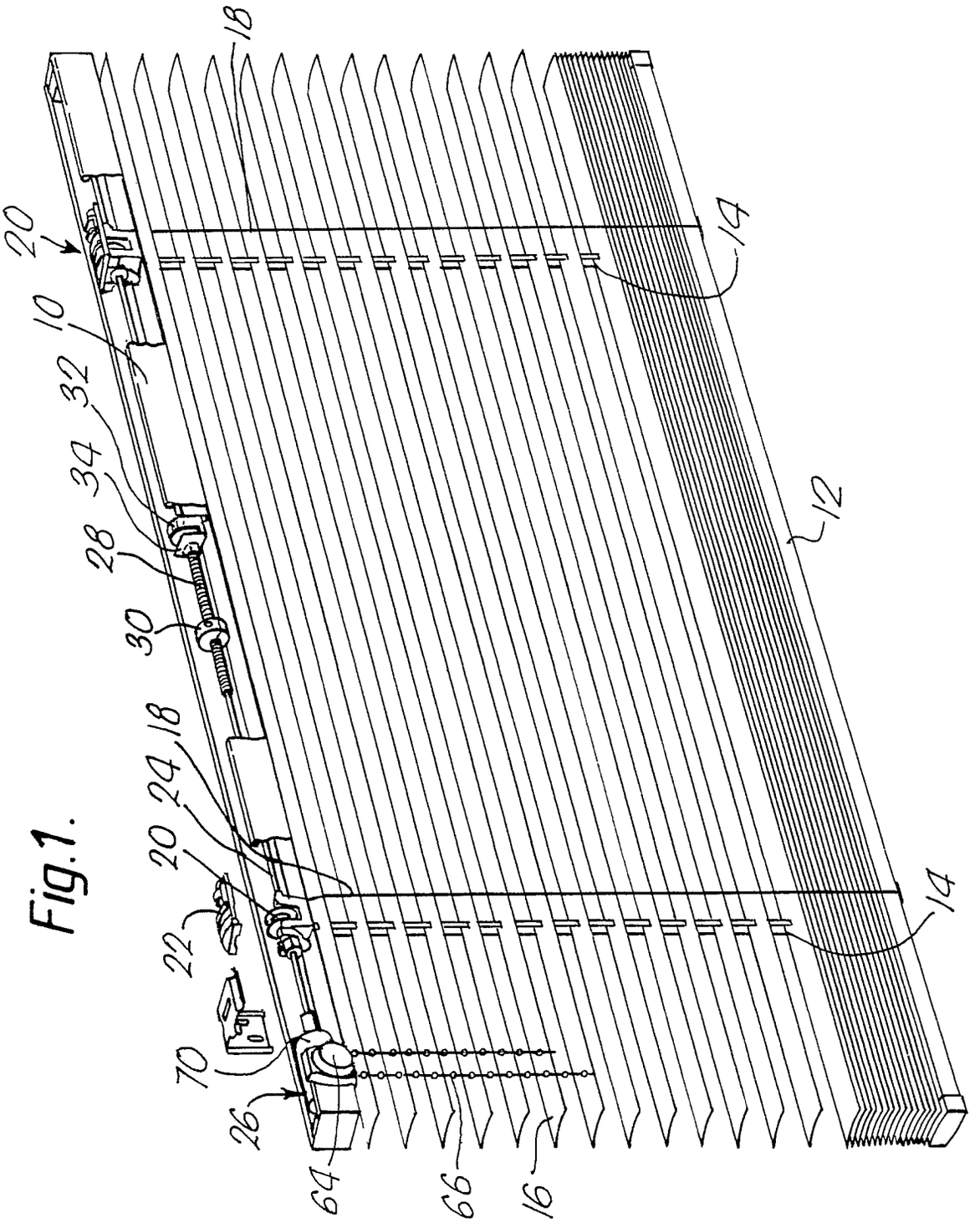

Fig.1.

Fig.2.

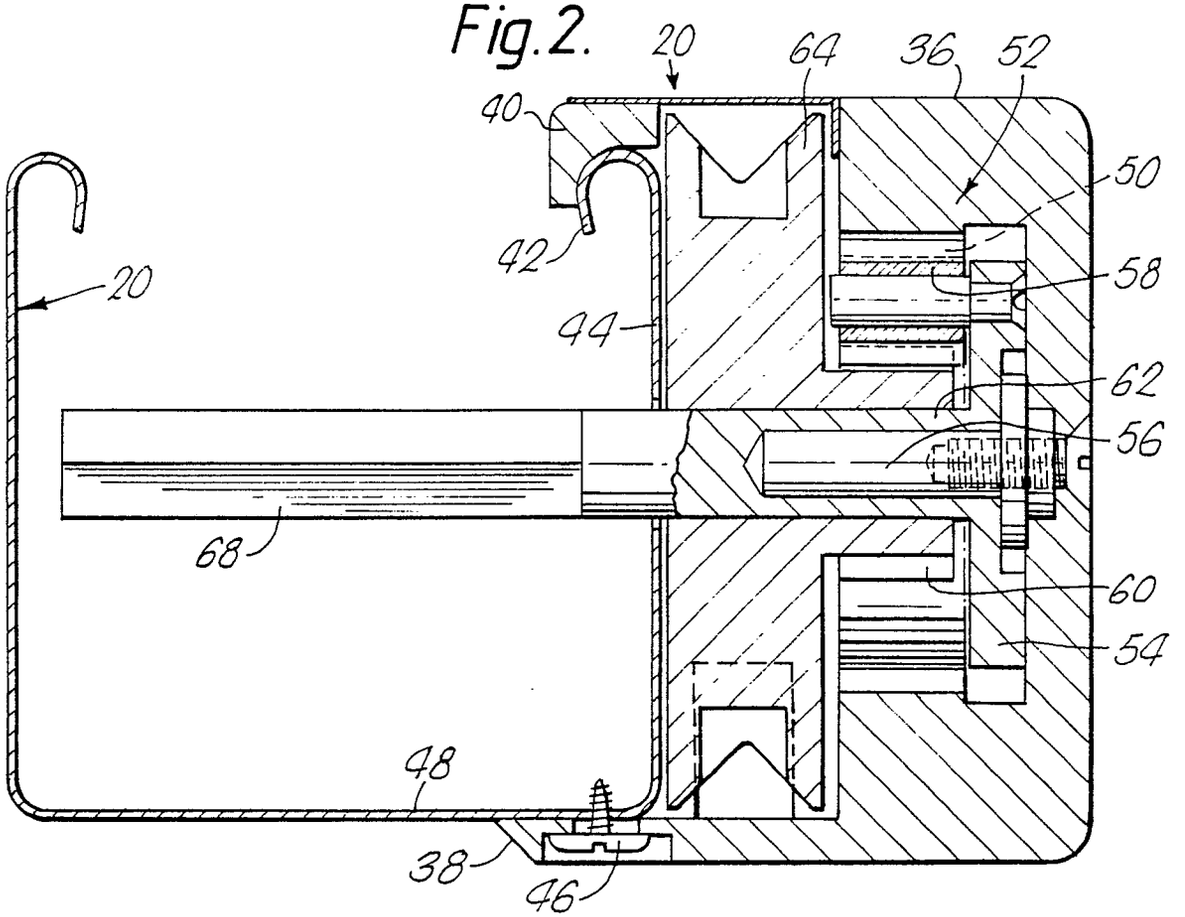
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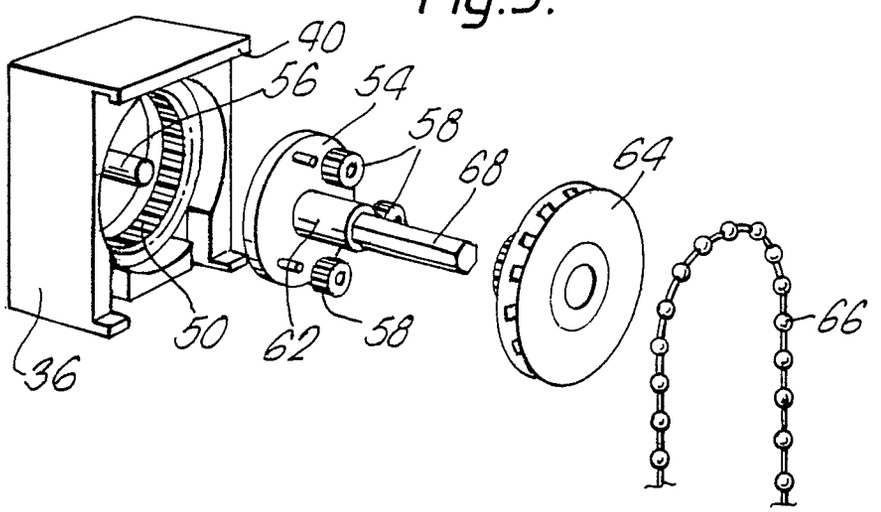
Fig.3.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EUROPEAN SEARCH REPORT

Application Number

EP 89 31 2388

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-3 636 855 (RADEMACHER) * Column 3, lines 65-69; column 4, lines 1-2,15-34; column 6, lines 47-68; column 7, lines 1-7; figure 3 *	1	E 06 B 9/307
A	GB-A- 670 935 (LEVOLOR LORENTZEN) * Page 2, lines 46-60; figure 3 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E 06 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27-02-1990	KUKIDIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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