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(54) **A device for vertically driving furniture piece wings**

(57) A device (1) for vertically driving furniture piece wings (3), characterized in that said device comprises a multiple hoist structure associated with a body of a furniture piece including at least a vertically movable wing (3), said structure comprising a gas spring (4) associated, at a top portion thereof, with a fixed wheel bearing plate (20), integral with a holding body and, at a bottom portion thereof, with a movable wheel bearing plate (16) for entraining a driving cable thereon, said driving cable (21) having an end portion integral with said wing (3) and another portion thereof integral with the fixed wheel bearing plate (20), said fixed and movable wheel hearing plates having each at least two coaxial pulleys for entraining said cable thereon.

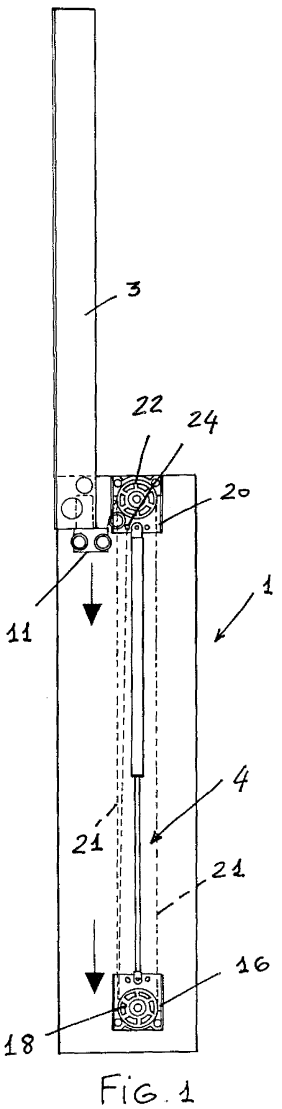

FIG. 1

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a driving device for vertically driving furniture piece wings.

[0002] The device according to the invention, in particular, has been designed for application to an inner portion of a furniture piece for allowing the furniture piece wings to be vertically slidably driven in a balanced manner.

[0003] As is known, vertically slidably wings are conventionally used in making furniture pieces such as lockers, cabinets and the like.

[0004] The above vertically slidable wings require mechanical driving mechanisms, to allow the wings to be properly operated for a long time.

[0005] Another requirement to be met in making slidable wing furniture pieces is that of providing a smooth movement without unbalancings of the sliding wings.

[0006] From an ergonomic and operational standpoint, it is moreover necessary to provide slidable wings which can be easily opened and closed by the user.

SUMMARY OF THE INVENTION

[0007] Accordingly, the aim of the present invention is to provide such a driving device for vertically slidably driving furniture piece wings which can be applied to an inner part of a furniture piece and which, moreover is adapted to allow the furniture piece wings to be easily slidably driven in a balanced manner.

[0008] Within the scope of the above mentioned aim, a main object of the invention is to provide such a wing driving device which is very advantageous from an ergonomic standpoint.

[0009] Yet another object of the present invention is to provide a strong and reliable wing driving device which is so designed as to exploit in an optimum manner the furniture piece available inner space.

[0010] Yet another object of the present invention is to provide such a furniture piece wing driving device which is very reliable and safe in operation.

[0011] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a device for vertically driving furniture piece wings, **characterized in that** said device comprises a multiple hoist structure associated with a body of a furniture piece including at least a vertically movable wing, said structure comprising a gas spring associated, at a top portion thereof, with a fixed wheel bearing plate, integral with a holding body and, at a bottom portion thereof, with a movable wheel bearing plate for entraining a driving cable thereon, said driving cable having an end portion integral with said wing and another portion thereof integral with the fixed wheel bearing plate, said fixed and movable wheel bearing plates having each at least two coaxial pulleys for entraining said cable thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention, which is illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is a longitudinally cross-sectioned side elevation view showing a furniture piece wing including a wing driving device according to the present invention, the wing being shown an open position thereof;
Figure 2 is a view similar to figure 1, but with the wing shown in a closed position thereof;
Figure 3 is a perspective view showing a piston, wheel bearing and transmission plate assembly included in the wing driving device according to the invention;
Figure 4 is an exploded perspective view of a fixed plate assembly included in the wing driving device according to the present invention;
and
Figure 5 is a further exploded perspective view of a movable plate assembly included in the wing driving device according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] With reference to the number references of the above mentioned figures, the furniture piece wing driving device according to the present invention, has been generally indicated by the reference number 1 and is applied at the side walls of furniture pieces designed for including at least a vertically slidable wing 3 therein.

[0014] More specifically, the device according to the present invention, which essentially constitutes a hoist structure adapted to balance the weight of the wing 3, comprises a transmission assembly 11, which, at a bottom portion thereof, is associated with the wing 3, and a gas spring 4 having its end portions respectively coupled to a movable wheel bearing plate 16 and a fixed wheel bearing plate 20.

[0015] Said spring gas spring 4 comprises a pneumatic piston 15 having a piston rod 14 to the bottom free end portion thereof 13 said movable wheel bearing plate 16 is coupled.

[0016] Said movable wheel bearing plate 16, in particular, comprises a plate-like element supporting two bottom coaxial pulleys 17 and 18 for entraining a driving cable 21 thereon.

[0017] Said bottom coaxial pulleys 17 and 18 are supported, as shown, by a shared pin 6 integral or rigid with said plate 16.

[0018] At the top thereof, said piston 15 is operatively coupled to the fixed wheel bearing plate 20 which supports two top coaxial pulleys 22 and 23 and a sheave 19 for entraining said operating cable 21 thereon.

[0019] Said top coaxial pulleys 22 and 23 are supported by a single shared pin 7, integral with said fixed wheel bearing plate 20.

[0020] Said fixed wheel bearing plate 20 comprises moreover an anchoring detent element 24 for a fixed end portion of said driving cable 21.

[0021] The other end portion of the cable 21 is applied to an element affixed to the wing 3, preferably to the transmission assembly 11 integral with said wing 3.

[0022] The arrangement of the transmission pulleys of the above disclosed hoist structure of the inventive device 1 is such that the lengths or portions of the cable 21 between a pulley and a following pulley are substantially parallel to the movement of the wing, and, accordingly, being substantially vertical, without inclinations, thereby limiting a far as possible operating forces in a direction perpendicular to the wing movement.

[0023] An important advantage of the hoist structure according to the present invention is constituted by the coaxial arrangement of the transmission pulleys and by the fact that said transmission pulleys have a comparatively large diameter so designed as to assure a bending radius of the cable 21 so large as to greatly reduce any torsional efforts or strain on said cable thereby providing a satisfactory sliding movement thereof.

[0024] Thus, the driving device has a smoother movement and the components thereof are subjected to a minimum wear.

[0025] The sliding movement can be applied to an inner surface of a furniture piece wall, or it can be left exposed to the view on the front of the furniture piece wall or can also be used as a replacement therefor,

[0026] It has been found that the invention fully achieves the intended aim and objects.

[0027] In fact, the invention provides a furniture piece driving device which has a very strong and simple construction, allowing to provide a reliable operation in the time.

[0028] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, depending on requirements.

Claims

1. A device for vertically driving furniture piece wings, **characterized in that** said device comprises a multiple hoist structure associated with a body of a furniture piece including at least a vertically movable wing, said structure comprising a gas spring associated, at a top portion thereof, with a fixed wheel bearing plate, integral with a holding body and, at a bottom portion thereof, with a movable wheel bearing plate for entraining a driving cable thereon, said driving cable having an end portion integral with said wing and another portion thereof integral with the fixed wheel bearing plate, said fixed and movable wheel bearing plates having each at least two coaxial pulleys for entraining said cable thereon.

2. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said gas spring comprises a pneumatic piston having a piston rod including a free end portion to which said movable wheel bearing plate is applied, said piston having a piston body associated with said fixed wheel bearing plate.

3. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said movable wheel bearing plate comprises a plate element supporting two bottom coaxial pulleys for entraining said cable thereon, said bottom coaxial pulleys being supported by a single supporting pin integral with said movable plate.

4. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said fixed wheel bearing plate supports two coaxial top pulleys and a sheath element for entraining said cable thereon, said top coaxial pulleys being supported by a single supporting pin integral with said fixed plate.

5. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said fixed wheel bearing plate supports two top coaxial pulleys and a respective sheave element for entraining said cable thereon, said top coaxial pulley being supported by a single supporting pin integral with said fixed plate, said fixed wheel bearing plate comprising moreover an anchoring detent element for a fixed end portion of said cable.

6. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** the end portion of said cable integral with said wing is applied to a transmission assembly associated with said wing.

7. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said hoist structure transmission pulleys are so arranged that the cable lengths between a pulley and a following pulley are substantially parallel to the movement of the wing, that is substantially vertical, without inclinations, thereby limiting as far as possible forces operating in a direction perpendicular to the wing movement.

8. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** the co-

axial arrangement of said transmission pulleys and the diameter of said transmission pulleys provide a cable bending radius so large as to reduce to a minimum the torsional efforts on said cable while allowing said cable to smoothly slide.

9. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said device has a smooth operating movement, thereby the components of said device are subjected to a very low wear.

10. A device for vertically driving furniture piece wings, according to claim 1, **characterized in that** said device is adapted to be applied to an inner surface of a furniture piece wall, or to be left exposed to the view applied on the front portion of said furniture piece or used as a replacement thereof.

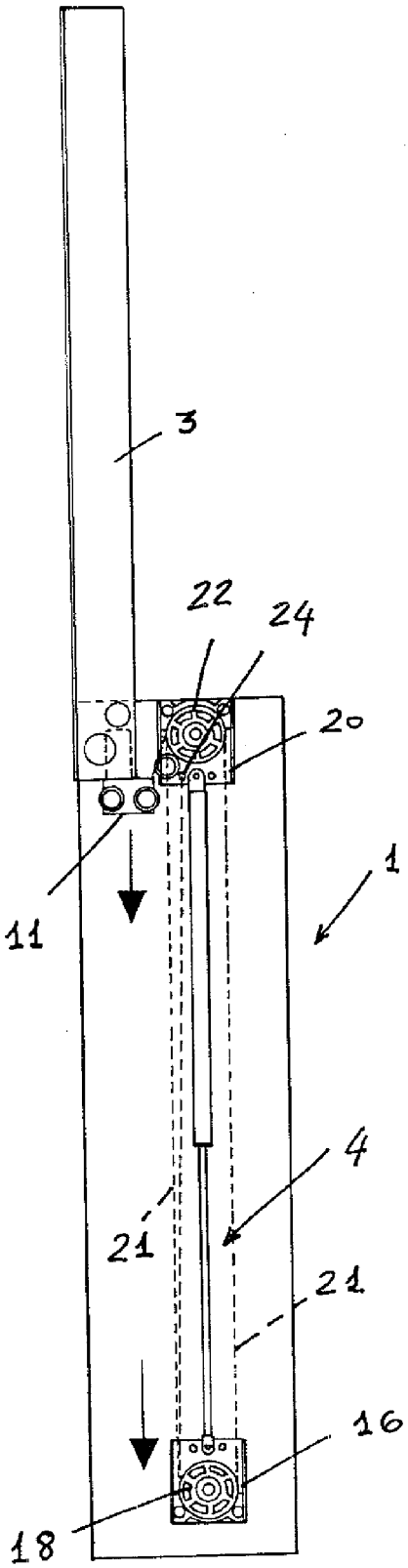

FIG. 1

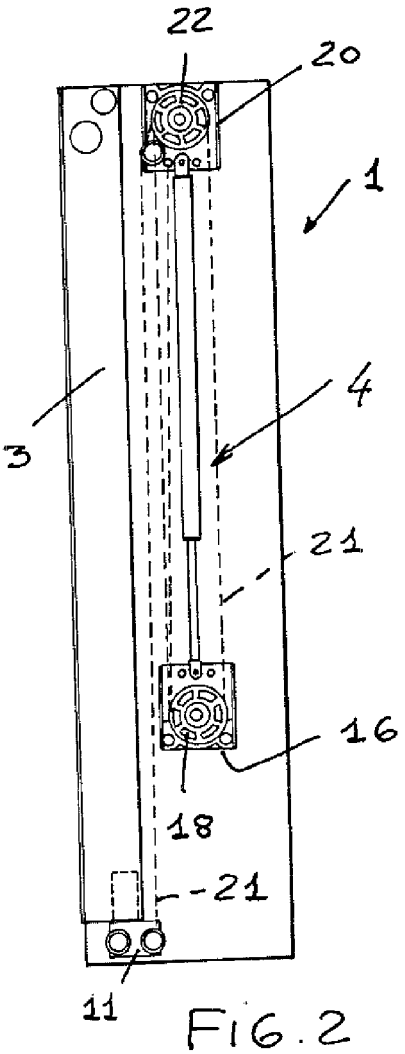

FIG. 2

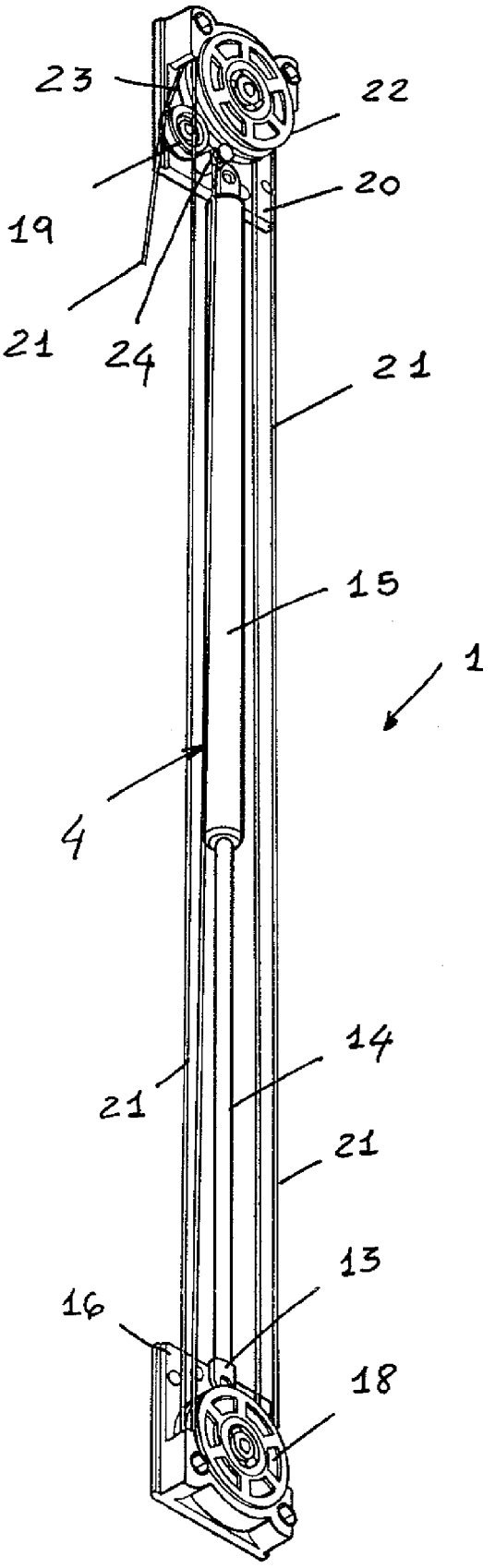

FIG. 3

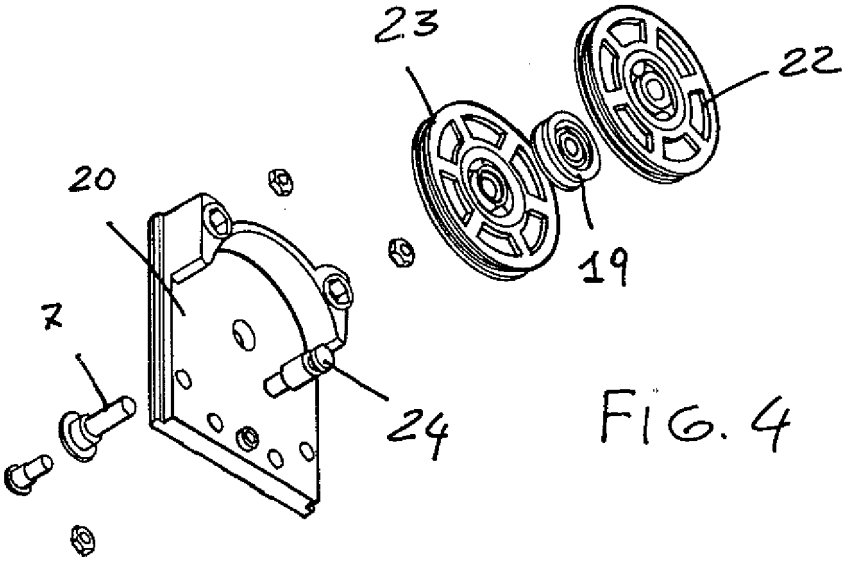

FIG. 4

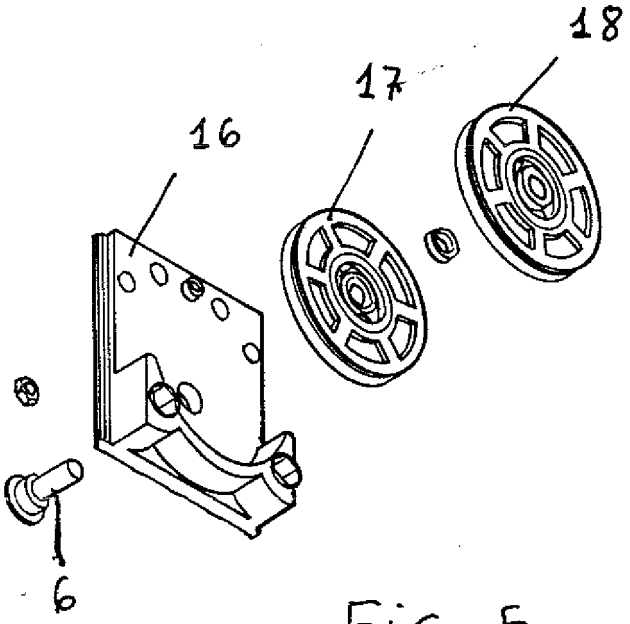

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 09 17 4083

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 642 845 A (MARSHIK GARY J [US]) 17 February 1987 (1987-02-17) * column 3, line 28 - column 5, line 16 * * figures * -----	1-10	INV. E05D13/00
A	EP 0 953 713 A (SALICE ARTURO SPA [IT]) 3 November 1999 (1999-11-03) * paragraph [0034] * * figure 4 * -----	5	

TECHNICAL FIELDS SEARCHED (IPC)

E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 December 2009	Van Kessel, Jeroen

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 17 4083

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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07-12-2009

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US 4642845 A	17-02-1987	CA 1280318 C	19-02-1991
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		DE 29807679 U1	06-08-1998
		ES 2291003 T3	16-02-2008

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82