(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 544 112 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.06.2005 Bulletin 2005/25

(51) Int Cl.[7]: **B65B 51/06**

(21) Application number: **04106568.1**

(22) Date of filing: **14.12.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(30) Priority: **17.12.2003 IT MI20032490**

(71) Applicant: **MARCHETTI, Antonio**
20142 MILANO (IT)

(72) Inventor: **MARCHETTI, Antonio**
20142 MILANO (IT)

(74) Representative: **Mittler, Enrico et al**
Mittler & C. s.r.l.,
Viale Lombardia, 20
20131 Milano (IT)

(54) Device for adjusting the pressure exerted by a taping machine unit transporting carriage on a parallelepiped box in transit for a taping operation

(57) It is described a device for adjusting the pressure exerted by a taping machine unit transporting carriage (51) on a parallelepiped box (23) in transit for a taping operation, comprising a support (53) for said unit transporting carriage (51) which is height adjustable by means of a first adjusting screw (55), moved by a crank (60), with which a nut screw (59) cooperates. Said device also comprises a spring (58) placed between said nut screw (59) and an adjusting nut (57) screwed on a second adjusting screw (54) sliding along said first adjusting screw (55) and carrying said support (53).

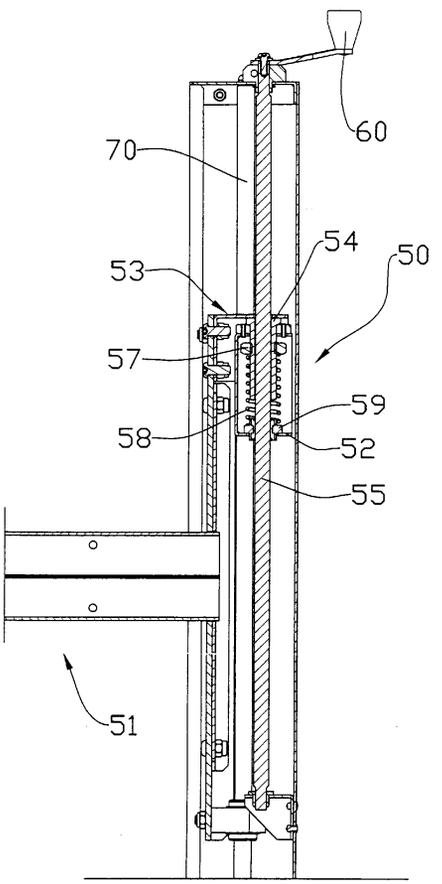

FIG.7

EP 1 544 112 A1

Description

[0001] The present invention concerns a device for adjusting the pressure exerted by a taping unit transporting carriage on a parallelepiped box in transit for a taping operation.

[0002] It is known a compressed air pneumatic system patented by Augusto Marchetti (US-4060442).

[0003] A pneumatic system demands obviously a complexity of installation, use and maintenance certainly not negligible.

[0004] The total cost of said system also compromises the commercial success that a mechanical system without the problems above mentioned could guaranty.

[0005] It is also comprehensible the necessity of limiting at pleasure the load of said taping unit transporting carriages on the box in transit, since said pressure could compromise the right closure of the box and finally the security of the transport of the product housed in the box, which will next be moved more times before arriving at the final consumer.

[0006] The risk of losing the product for damaging justifies the effort for reaching a good and economically convenient solution.

[0007] In view of this state of the art, object of the present invention is to realize a cheap device that allows to adjust mechanically the pressure exerted downwards by the taping unit transporting carriage on the box in transit.

[0008] According to the present invention said object is reached by means of a device for adjusting the pressure exerted by a taping unit transporting carriage on a parallelepiped box in transit for a taping operation, comprising a support for said unit transporting carriage which is height adjustable by means of a first adjusting screw, moved by a crank, with which a nut screw cooperates, characterized in that it comprises a spring placed between said nut screw and an adjusting nut screwed on a second adjusting screw sliding along said first adjusting screw and carrying said support.

[0009] The following description of an embodiment of said device will clear its extreme simplicity. No pneumatic or oil-dynamic command system is necessary.

[0010] The lightening function is carried out by a very simple spring system.

[0011] The characteristics and the advantages of the present invention will be made evident by the following detailed description of an embodiment thereof, which is illustrated as non-limiting example in the enclosed drawings, in which:

Fig.1 is a perspective view of a machine comprising a device according to the present invention;
Fig.2 is a sectional frontal view of the device according to the present invention;
Fig.3 is a sectional view from right of Fig.2;
Fig.4 is an enlarged sectional view of a particular of Fig.3;
Fig. 5 is a sectional view according to the line V-V of Fig.3;
Fig.6 is a sectional view according to the line VI-VI of Fig.3;
Fig.7 is a sectional view of the spring system with said spring unloaded;
Fig. 8 is a sectional view of the spring system with said spring preloaded.

[0012] A machine for the motion of "plane belts" parallelepiped boxes comprises (Fig. 1) a base frame 1 which supports an internal motor 2 that commands a lower driving group 3 and a higher driving group 4 held up by a hollow beam 5 bound in a vertical sliding adjustable way to a hollow vertical column 6.

[0013] Said internal motor 2 commands, by means of a transversal shaft 80, a transmission 7 (Fig.2) that is formed by a toothed belt 8 stretched between two pinions 9-10, the second one embracing a pivot 11 connected by a lower angle transmission 12 to a vertical spline shaft 13.

[0014] The lower driving group 3, driven by said transversal shaft 80 by means of a chain transmission 14, comprises a small transversal shaft 15 at the ends of which two pulleys 16 and 17 are splined that transmit the motion to driving belts 18.

[0015] The vertical spline shaft 13 transmits the motion to a higher angle transmission 19 connected with a unit transporting carriage 51 comprising the higher driving group 4 and the hollow beam 5, which supports a transversal shaft 20 that, by a chain transmission 21, moves higher driving belts 22.

[0016] A device 50 (Fig. 2-8) movable along bars 70 allows to adjust the pressure exerted by the unit transporting carriage 51 on the parallelepiped box 23. Said device comprises a support 53 of said unit transporting carriage 51 that is held up by an adjusting screw 54, which embraces another adjusting screw 55 rotatable by means of a crank 60.

[0017] A housing 52 contains a nut screw 59 and an adjusting nut 57 screwed on the adjusting screw 54, that allows a preloading of a spring 58 placed between said nut 57 and the nut screw 59.

[0018] The operation of said device 50 is somewhat easy but at the same time extremely effective. Fig. 7 shows the device 50 with the spring 58 unloaded. In this situation the support 53 and the adjusting screw 54 rest on the housing 52, and therefore on the nut screw 59, so that all the weight of the unit transporting carriage 51 rests on the box 23 during the taping step.

[0019] On the contrary in Fig. 8, having moved opportunely the nut 57, the spring 58 has been preloaded, so that the load that rests on the adjusting screw 54 is balanced with the upward push of the preloaded compression spring. In this situation the box 23 meets a lower resistance of the unit transporting carriage 51 thanks to the spring 58 that releasing itself makes easy the lifting of the unit transporting carriage 51, which exerts a lower

pressure on the box 23.

[0020] By means of the nut screw 59 and of the rotation of the adjusting screw 55, driven by the crank 60, it is possible to adjust the height of the unit transporting carriage, without changing the adjustment of the spring 58.

[0021] After having adjusted the device 50, it is possible to start the command device which allows the perfectly synchronized movement of the belts 18 and 22.

[0022] The motor 2 in fact commands the rotation of the transversal spline shaft 80 that, by means of the transmission 7 and the lower angle transmission 12, allows the rotation of the vertical spline shaft 13 which, by means of the higher angle transmission 19, moves the higher transversal spline shaft 20 that, by means of the transmission 21, transmits the motion to the higher driving belts 22.

[0023] A chain transmission 14 transmits the motion from the transversal spline shaft 80 to the belts 18 of the lower driving group 3.

Claims

1. Device for adjusting of pressure exerted by a taping unit transporting carriage (51) on a parallelepiped box (23) in transit for a taping operation, comprising a support (53) for said unit transporting carriage (51) higher adjustable by means of a first adjusting screw (55), moves by a crank (60), with which a nut screw (59) cooperates, **characterized in that** it comprises a spring (58) placed between said nut screw (59) and an adjusting nut (57) screwed on a second adjusting screw (54) sliding along said first adjusting screw (55) and carrying said support (53).

2. Device according to claim 1, **characterized in that** the adjusting nut (57), the spring (58) and the nut screw (59) are contained in a housing (52).

3. Device according to claim 1, **characterized in that** said support (53) is sliding along vertical bars (70).

4. Device according to claim 1, **characterized in that** said unit transporting carriage (51) comprises a higher driving group (4) held up by a hollow beam (5).

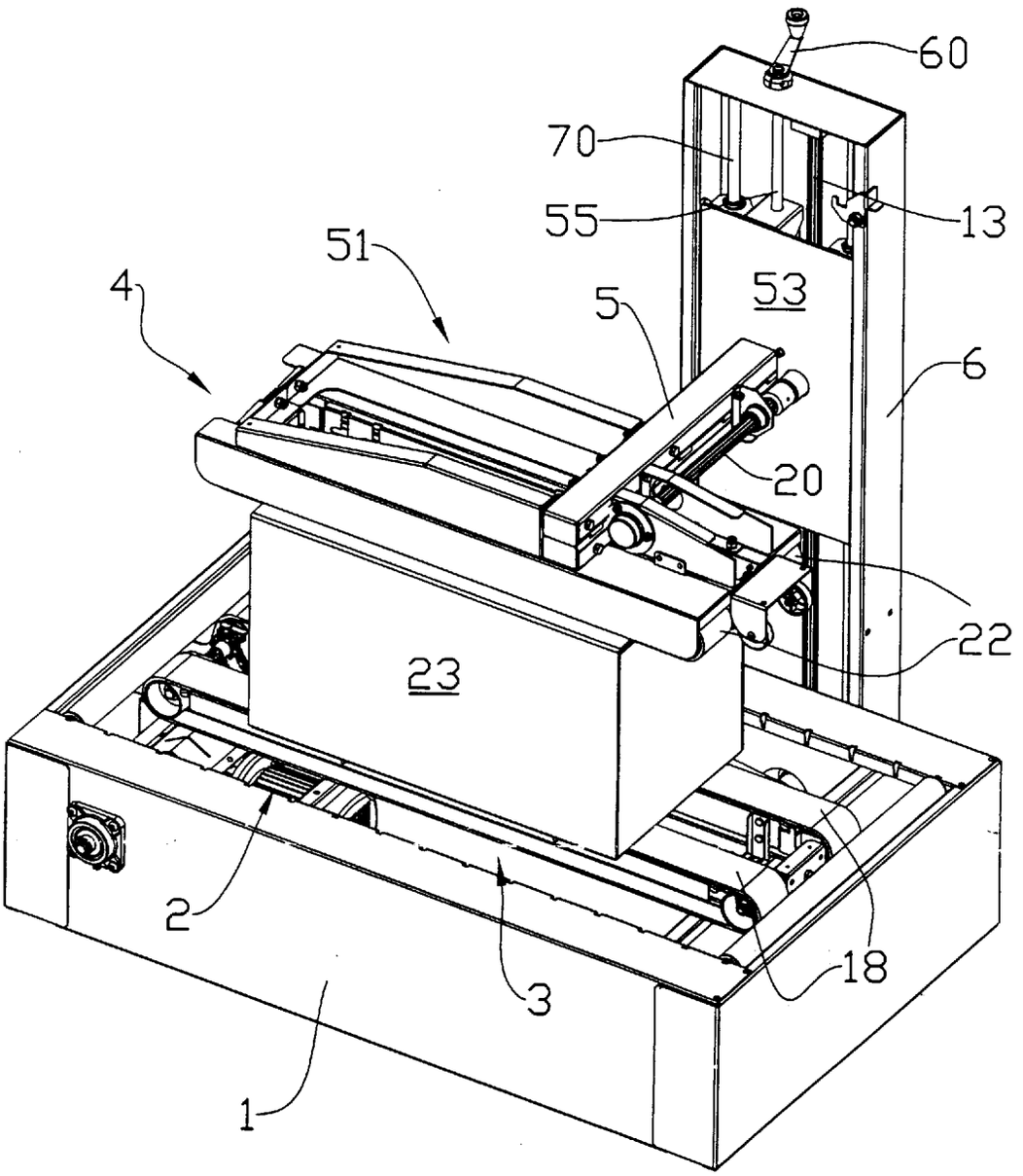

FIG.1

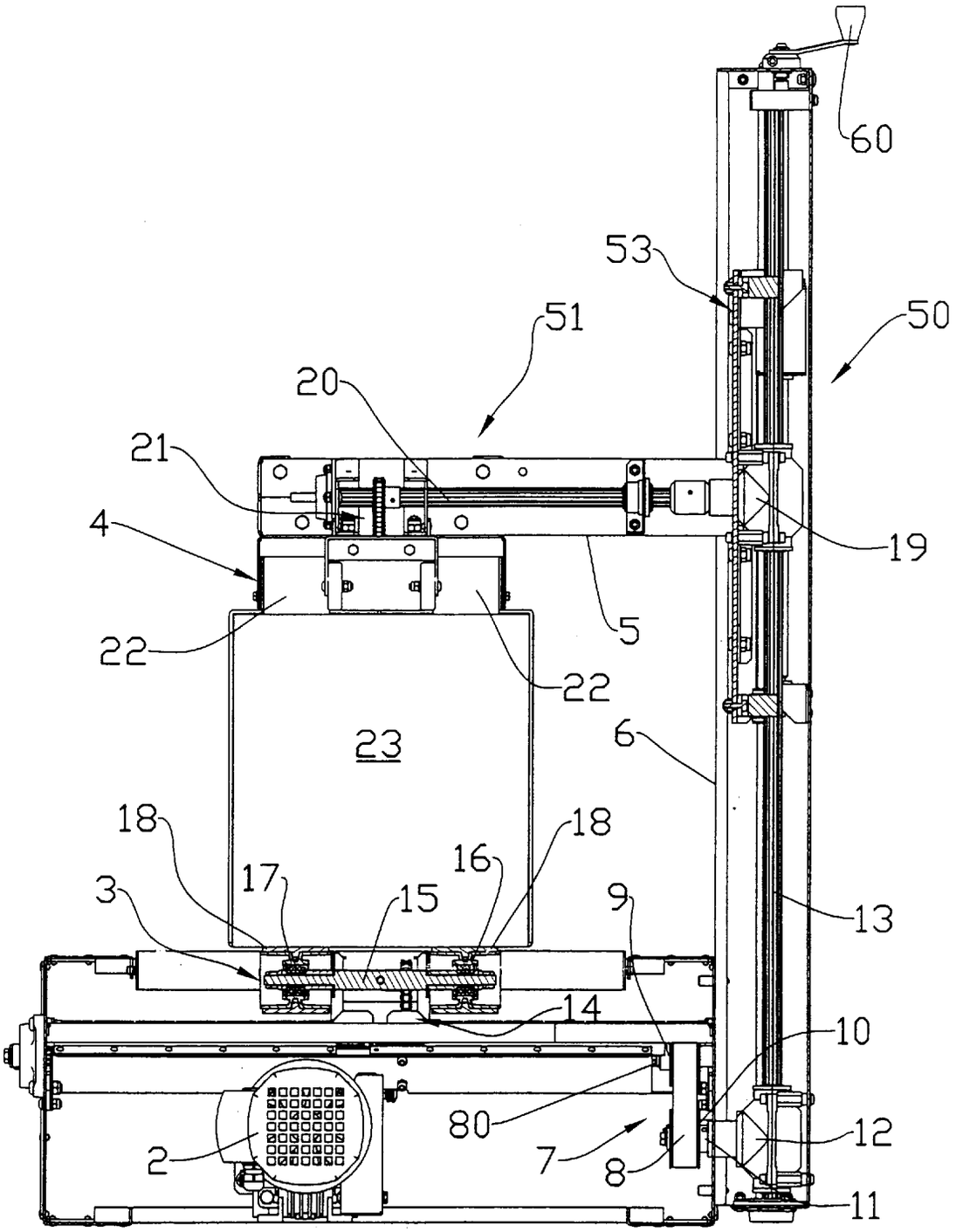
60
53
51
50
20
21
4
19
5
22
22
23
6
18
18
16
17
15
3
9
13
14
10
80
12
2
7
8
11

FIG.2

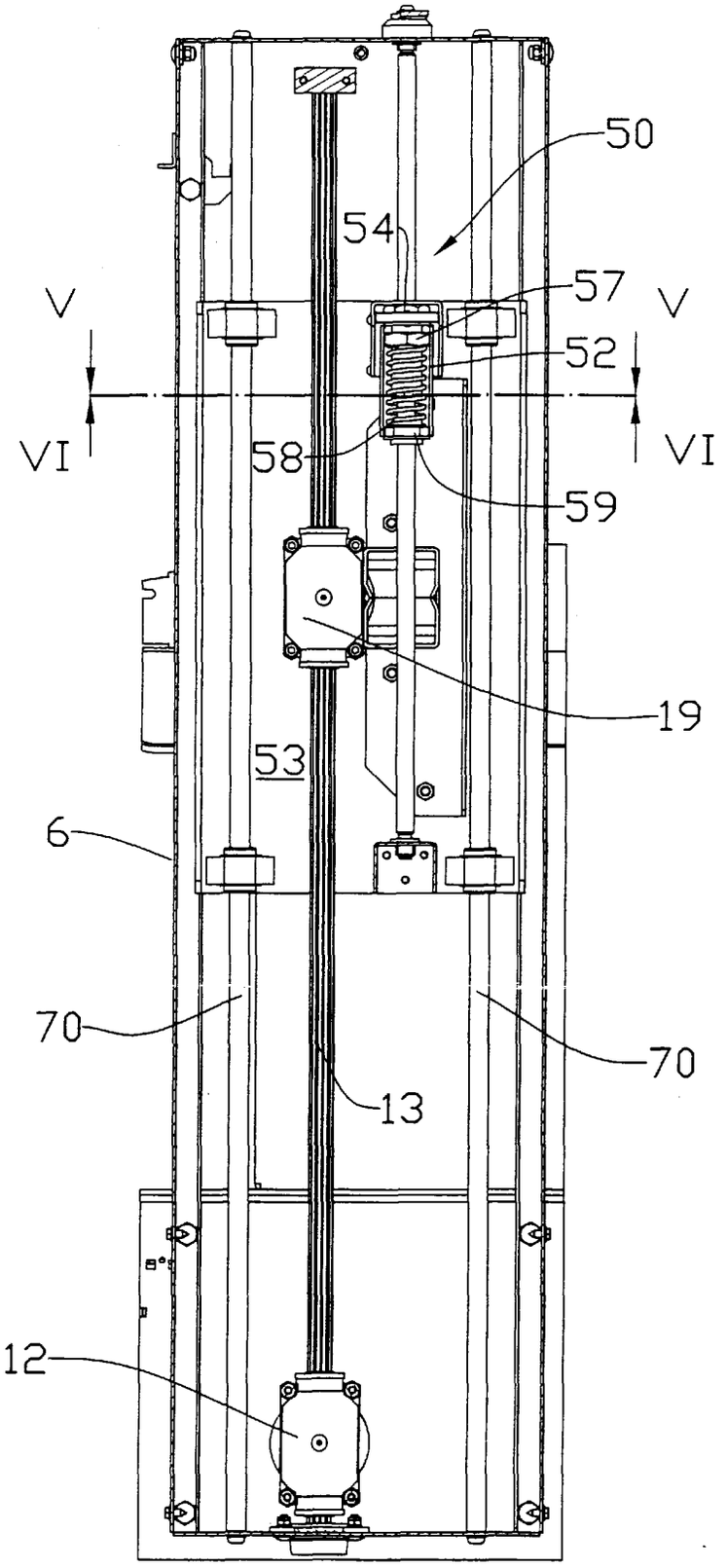

FIG.3

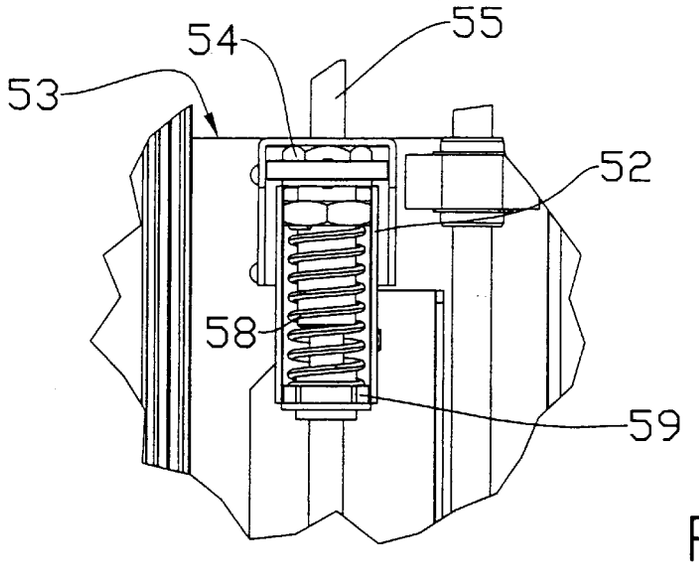

FIG.4

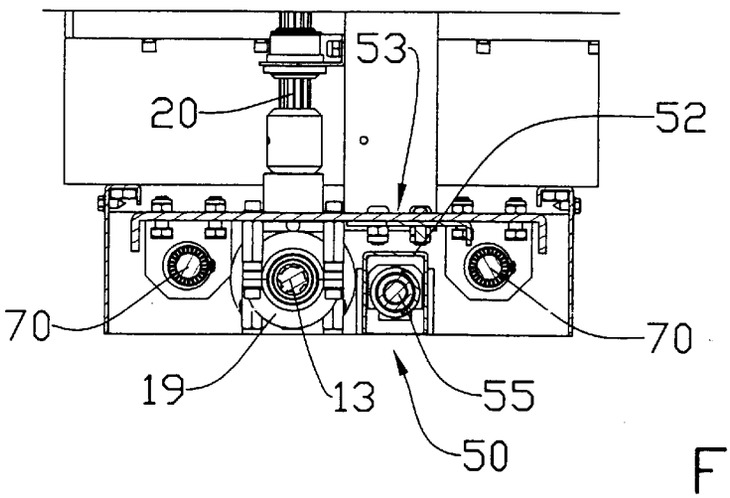

FIG.5

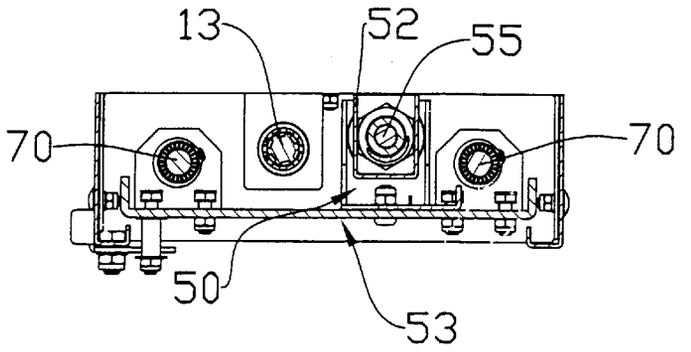

FIG.6

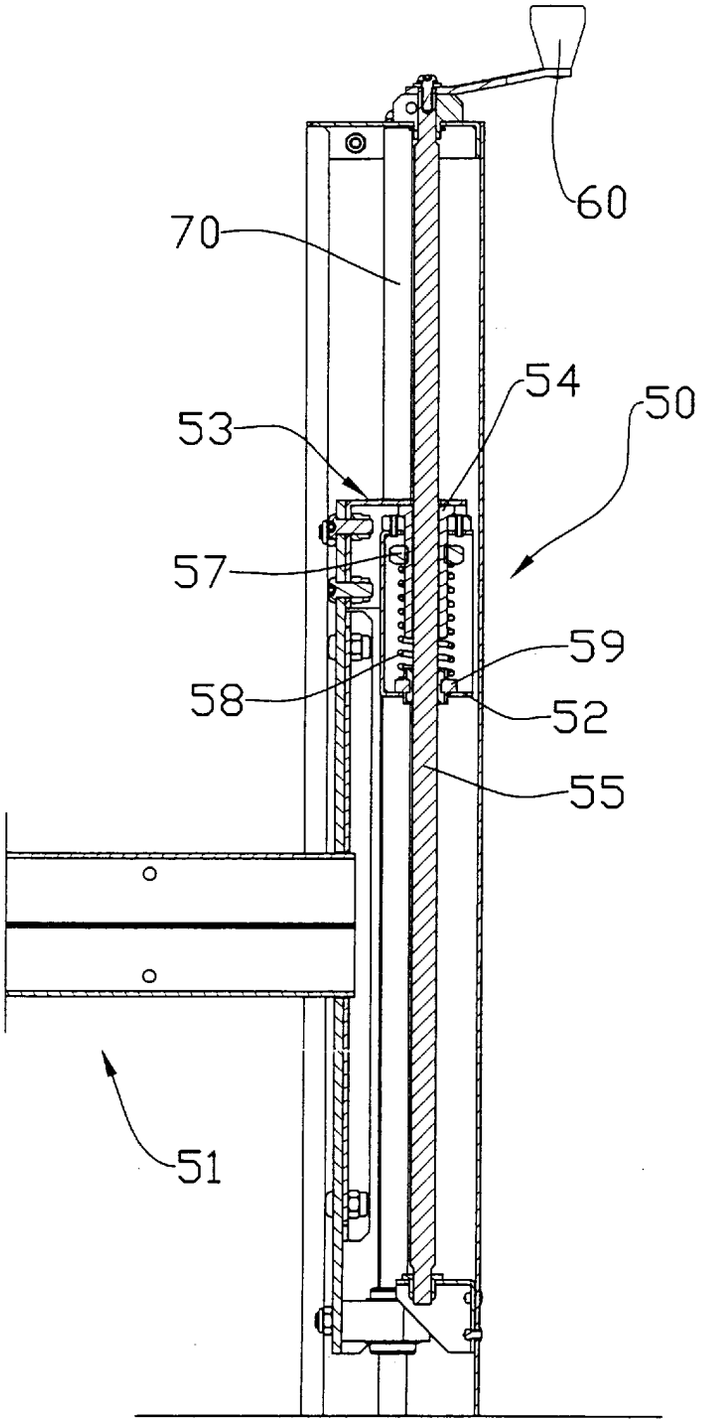

FIG.7

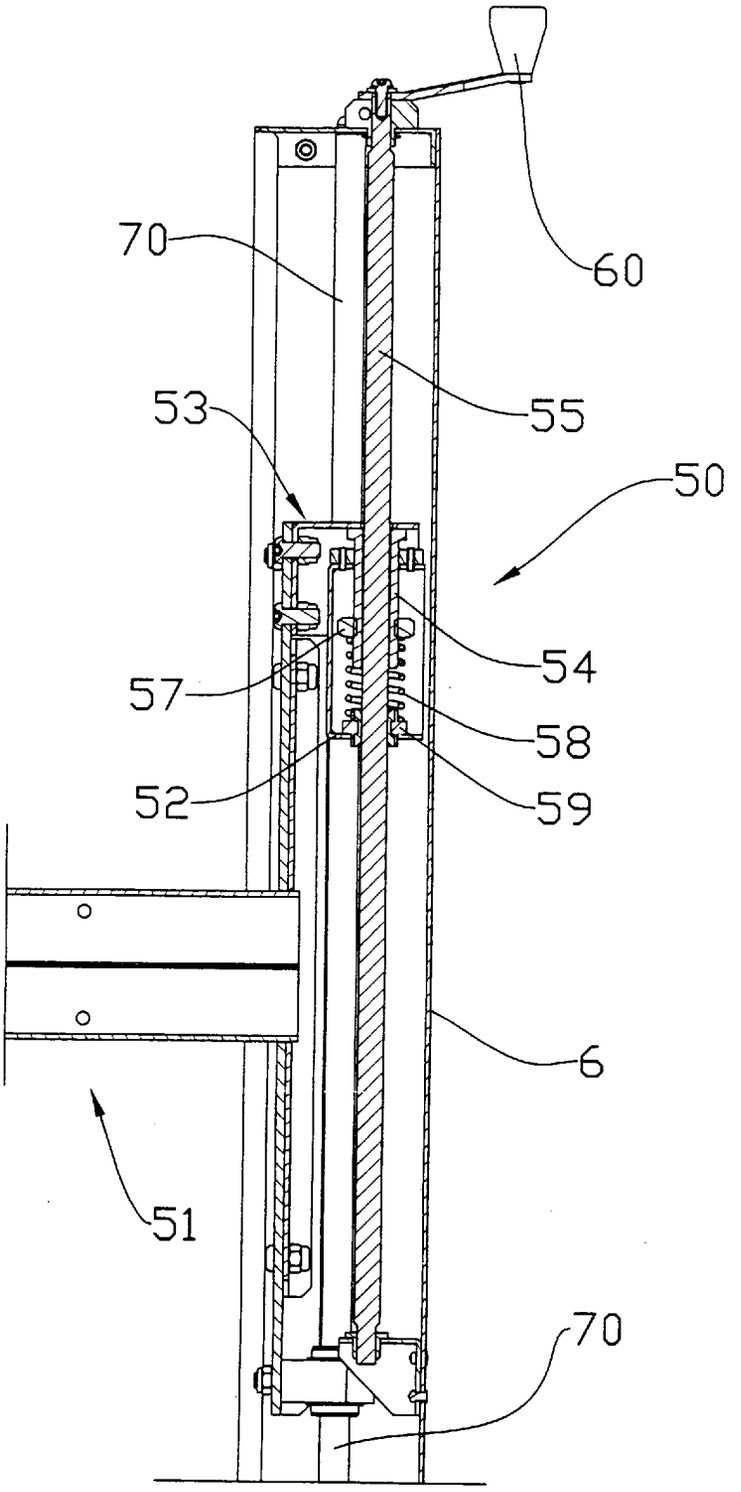

FIG.8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 10 6568

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.7)
D,A	US 4 554 042 A (MARCHETTI ET AL) 19 November 1985 (1985-11-19) * the whole document *	1-4	B65B51/06
A	GB 1 512 749 A (MARCHETTI A) 1 June 1978 (1978-06-01) * page 2, lines 54-119; figures *	1-4	
A	EP 0 846 621 A (CONNEX BEHEER B.V) 10 June 1998 (1998-06-10) * page 8; figures 1-5 *	1-4	
A	US 3 451 875 A (WINTON LOVELAND ET AL) 24 June 1969 (1969-06-24) * column 5, lines 37-50; figure 2 *	1-4	
A	US 3 530 025 A (BERNARDUS JAN ACHTERBERG) 22 September 1970 (1970-09-22) * column 5, line 62 - column 6, line 41; figures *	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 March 2005	Philippon, D

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 10 6568

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-03-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4554042 A	19-11-1985	IT 1135450 B	20-08-1986
		CA 1160187 A1	10-01-1984
		DE 3123194 A1	09-09-1982
		ES 8203291 A1	01-07-1982
		FR 2499938 A1	20-08-1982
		GB 2092988 A ,B	25-08-1982
GB 1512749 A	01-06-1978	DE 2651431 A1	08-06-1977
		ES 224593 U	16-01-1977
EP 0846621 A	10-06-1998	EP 0846621 A1	10-06-1998
US 3451875 A	24-06-1969	DE 1511686 A1	10-07-1969
		GB 1113384 A	15-05-1968
US 3530025 A	22-09-1970	NL 6709092 A	30-12-1968
		BE 717222 A	02-12-1968
		CH 467698 A	31-01-1969
		DE 1761692 A1	05-08-1971
		FR 1582538 A	03-10-1969
		GB 1233616 A	26-05-1971

EPO FORM P0459

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