



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 978 453 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.02.2000 Bulletin 2000/06

(51) Int. Cl.⁷: **B65B 43/26, B31B 5/76**

(21) Application number: **99114266.2**

(22) Date of filing: **28.07.1999**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Monti, Giuseppe**
40065 Pianoro (Bologna) (IT)

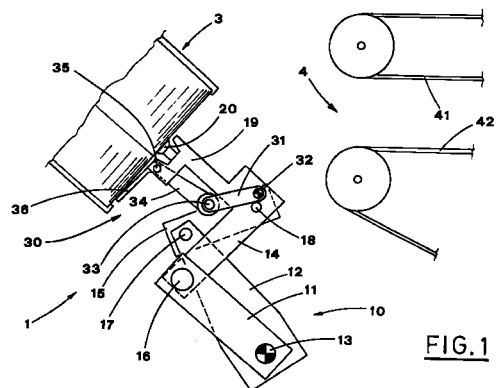
(30) Priority: **03.08.1998 IT BO980486**

(74) Representative:
Dall'Olio, Giancarlo
c/o INVENTION s.a.s.,
Via delle Armi, 1
40137 Bologna (IT)

(71) Applicant:
MARCHESINI GROUP S.p.A.
I-40065 Pian di Macina Pianoro (Bologna) (IT)

(54) **Device for erecting flat folded carton sleeves**

(57) A device for erecting flat folded carton sleeves includes a lever mechanism (10) supporting withdrawing means (20) and oscillating between a position, in which the withdrawing means withdraw a flat folded carton sleeve (2) from a magazine (3) and a position in which an erected sleeve is released to a conveying line (4). A folding mechanism (30) is articulated to said lever mechanism (10) and oscillates, so as to act on said sleeve (2) to erect it, while the sleeve is being transferred, kept by said withdrawing means (20), from the position of withdrawal from the magazine (3) to the release position.



EP 0 978 453 A1

Description

[0001] The present invention relates to a device for erecting flat folded carton sleeves into cartons.

[0002] Packaging of various articles requires erecting flat folded carton sleeves which will form packages.

[0003] The sleeves are usually supplied in flat folded configuration and are stacked in suitable magazines of the packaging machine.

[0004] Various devices for erecting flat folded carton sleeves have heretofore been provided. These devices include e.g. means for taking over sleeves to be erected, like suction means and similar, carried by lever systems which move the taking over means from a position in which a sleeve to be erected is withdrawn from the magazine, to a position in which the already erected sleeve is placed on the conveying line of the packaging machine.

[0005] The sleeve is erected either by other gripping means which grip the sleeve on the surface opposite to the one acted upon to withdraw the sleeve, and are operated to move with respect to the taking over means, or by stationary abutment means which strike the withdrawn sleeve during the transferring to the conveying line.

[0006] The means used for erecting flat folded carton sleeves are usually complicated and often rather big.

[0007] In fact, a special working station is needed for erecting flat folded carton sleeves.

[0008] The present invention was evolved with the general object of providing a device for simple erecting flat folded carton sleeves during their transfer from the relative magazine to a conveying line for subsequent packaging steps.

[0009] Another object of the present invention is to propose a device for erecting flat folded carton sleeves, which is simple, versatile and has limited dimensions.

[0010] The above mentioned objects are obtained in accordance with the contents of the claims.

[0011] The characteristic features of the present invention will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

- Figure 1 is a schematic lateral view of the proposed device during withdrawing of a flat folded carton sleeve;
- Figures 2, 3 and 4 are lateral views of the proposed device, during subsequent working steps.

[0012] Reference numeral 1 generally designates a device for erecting flat folded carton sleeves 2.

[0013] Flat folded carton sleeves 2 to be erected are stacked inside a magazine 3, open at the bottom and preferably inclined.

[0014] The device 1 includes a lever mechanism 10, which features a first arm 11 and a second arm 12, each one pivoted at one end to a stationary frame, about a

common axis of a first horizontal pin 13.

[0015] The arms 11, 12 are driven into oscillation within parallel vertical planes by independent driving means, e.g. cams or the like, which are not shown.

[0016] The free end of the first arm 11 supports a first connecting rod 14, which is hinged thereto by a second horizontal pin 16.

[0017] Likewise, the free end of the second arm 12 supports a second connecting rod 15, hinged thereto by a third horizontal pin 17.

[0018] The connecting rods 14, 15 are hinged to each other, at their ends not hinged to the arms 11, 12, by a fourth pin 18.

[0019] The first connecting rod 14 carries, integral therewith, a taking over member 19, suitably squared shaped and extending within the same vertical plane in which the first connecting rod oscillates.

[0020] The taking over member 19 carries on its free end withdrawing suction cups 20, which are connected to suction means for withdrawing the lowermost sleeve 2 from the magazine 3.

[0021] The device 1 includes also a folding mechanism 30 featuring a third arm 31, which is pivoted to the stationary frame on a fifth pin 32 having a horizontal axis. Therefore, the third arm 31 oscillates within a vertical plane, parallel to the oscillation plane of the first and second arms 11, 12.

[0022] A third connecting rod 34 is hinged at one end to the third arm 31 by means of a sixth pin 33, and at the other end to the taking over member 19 by means of a seventh pin 35.

[0023] A folding member 36 is joined to the third connecting rod 34 at a suitable angle with respect to the longitudinal axis thereof.

[0024] Operation of the device will be now described beginning from the withdrawing of a flat folded carton sleeve 2 from the magazine 3.

[0025] During the withdrawing, the taking over member 19 carrying the suction cups 20 is brought to a position, in which it is substantially perpendicular to the bottom of the magazine 3, so that the lowermost carton sleeve 2 goes in abutment against the suction cups 20 (Figure 1).

[0026] It is to be noted that this withdrawing position of the suction cups 20 is determined by the reciprocal positions of the first arm 11 and the second arm 12. Although the first arm 11 and the second arm 12 are operated independently, they are moved in time relation and are linked to each other by the respective first and second connecting rod 14, 15, which in their turn, are hinged to each other by the fourth pin 18.

[0027] In fact, the taking over member 19 carrying the suction cups 20 is an extension of the first connecting rod 14.

[0028] The first arm 11 is imparted a rotation, so as to withdraw the carton sleeve 2 from the magazine 3.

[0029] With the second arm 12 being motionless, the rotation of the first arm 11 determines an inverse rota-

tion of the first connecting rod 14, and consequently, inclination of the taking over member 19, on which the carton sleeve 2 is kept (Figure 2) .

[0030] Subsequently, the first arm 11 and the second arm 12 are imparted rotations in the same direction and with equal amplitudes, which allows the first connecting rod 14, carrying the carton sleeve 2 on the taking over member 19, to continue its rotation (Figure 3) .

[0031] The rotation of the first connecting rod 14 drives to move the third connecting rod 34, which has the folding member 36 joined thereto.

[0032] The folding member 36 acts on the wall of the carton sleeve 2 adjacent to its wall kept by the suction cups 20, thus erecting the sleeve.

[0033] The first arm 11 and the second arm 12 continue to rotate in the same direction, but the rotation amplitude of the first arm 11 is bigger until the angle defined by the reciprocal positions of the arms reaches the maximum amplitude, so that the sleeve 2 is introduced between the opposite belts 41, 42 of a conveying line 4, which moves in a continuous or intermittent way (Figure 4).

[0034] It is to be noted that when the sleeve 2 is introduced between the belts 41, 42 of the conveying line, the folding member 36 folds the sleeve 2 by an angle slightly bigger than the final one, so as to yield it to such an extent as to prevent the material elastic return.

[0035] Then, the device returns to the position for withdrawing and erecting a subsequent flat folded carton sleeve.

[0036] Thus, the proposed device fulfils the object of simple erecting flat folded carton sleeves.

[0037] It is to be noted that flat folded carton sleeves are erected during their transfer from the magazine to a line conveying erected sleeves for subsequent packaging steps.

[0038] Moreover, the proposed device is small and does not feature stationary abutment elements and the like.

[0039] Another advantage of the present invention derives from the fact that it allows an easy change over when the size of flat folded carton sleeves to be erected is changed, without complicated adjustment operations.

Claims

1. Device for erecting flat folded carton sleeves characterised in that it includes:

a lever mechanism (10) supporting withdrawing means (20) and oscillating between a withdrawing position, in which said withdrawing means withdraw a flat folded carton sleeve (2) from a magazine (3) and a release position, in which the same erected sleeve is released to a conveying line (4);
an oscillating folding mechanism (30), which is articulated to said lever mechanism (10) so as

to act on said sleeve (2) to erect it, when said sleeve is kept by said withdrawing means (20) while being transferred from said withdrawing position to said release position.

2. Device according to claim 1, characterised in that said lever mechanism (10) includes a first arm (11) and a second arm (12), each one pivoted at one end to a stationary frame by a common pin (13) and supporting, at their free ends, respectively, a first and a second connecting rod (14,15), said first and second connecting rods being hinged to each other by a further pin (18), with said first connecting rod (14) carrying said withdrawing means (20)

3. Device according to claim 2, characterised in that said first arm (11), second arm (12) and said first oscillating folding mechanism (30) oscillate within parallel vertical planes.

4. Device according to claim 2, characterised in that said first arm (11) and second arm (12) are driven into oscillation within parallel vertical planes by respective, independent driving means.

5. Device according to claim 2, characterised in that said first connecting rod (14) carries, integral therewith, a substantially square shaped taking over member (19) extending in the vertical plane within which the first connecting rod oscillates, and carrying, at its free end, said withdrawing means (20).

6. Device according to claim 1, characterised in that said folding mechanism (30) includes a third arm (31) hinged at an end to a stationary frame and carrying hinged at the other end a third connecting rod (34), which is hinged with the opposite end to the same lever mechanism (10) near the region of said withdrawing means, said third connecting rod (34) having a folding member (36) joined thereto.

7. Device according to claim 6, characterised in that said folding member (36) is suitably angled with respect to the longitudinal axis of said third connecting rod (34) and connected to this latter in the region of another pin (35), by which said third connecting rod (34) is articulated to said lever mechanism (10), so that said folding member (36) acts on the wall of the flat folded carton sleeve (2) adjacent to the wall kept by said withdrawing means (20), so as to erect the sleeve.

8. Device, according to claim 1, characterised in that said lever mechanism (10) include a first arm (11) and a second arm (12), each one pivoted at one end to a common pin (13), so as to oscillate within parallel planes, and supporting, at their free ends, respectively, a first and a second connecting rod

(14,15), said first and second connecting rods being hinged to each other by a further pin (18), with said first connecting rod (14) carrying said withdrawing means (20), and in that said folding mechanism (30) includes a third arm (31) pivoted to a stationary frame and oscillating within a plane parallel to the ones of said first arm (11) and second arm (12), said third arm (31) carrying hinged thereto a third connecting rod (34), which is hinged, at the end opposite to said first connecting rod (14), to said folding mechanism (30) near said withdrawing means, said third connecting rod (34) having a folding member (36) joined thereto.

5

10

15

20

25

30

35

40

45

50

55

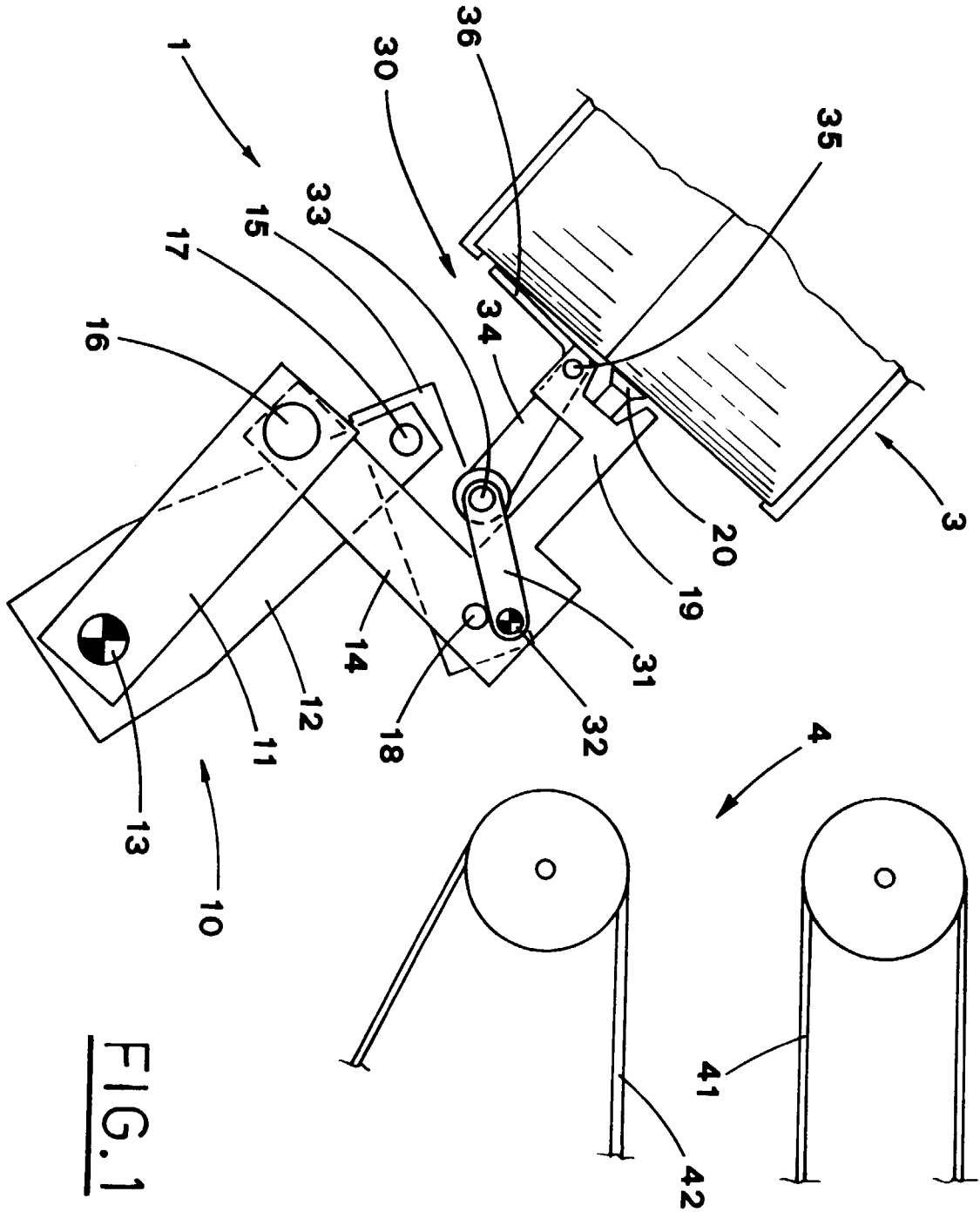


FIG. 1

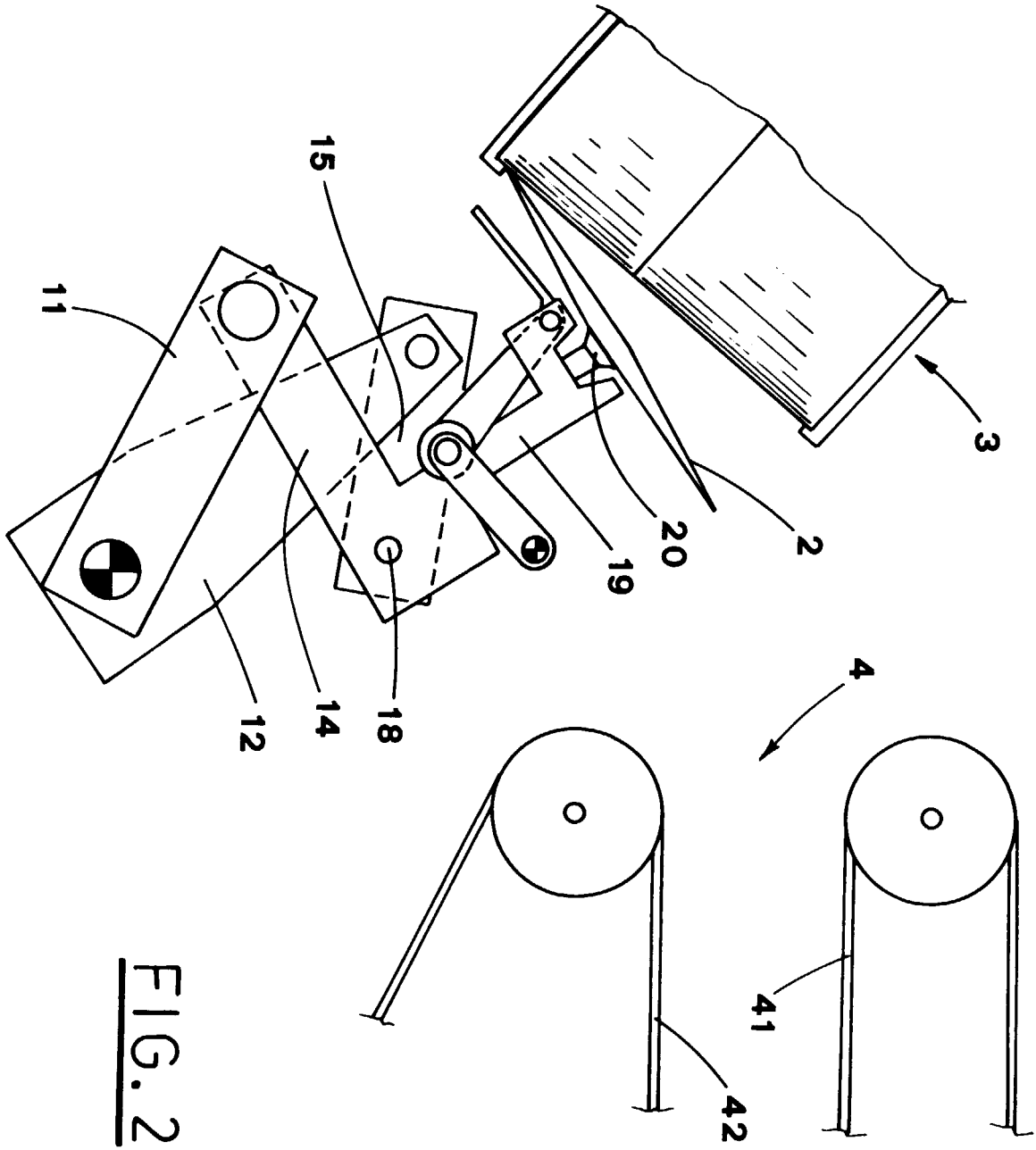


FIG. 2

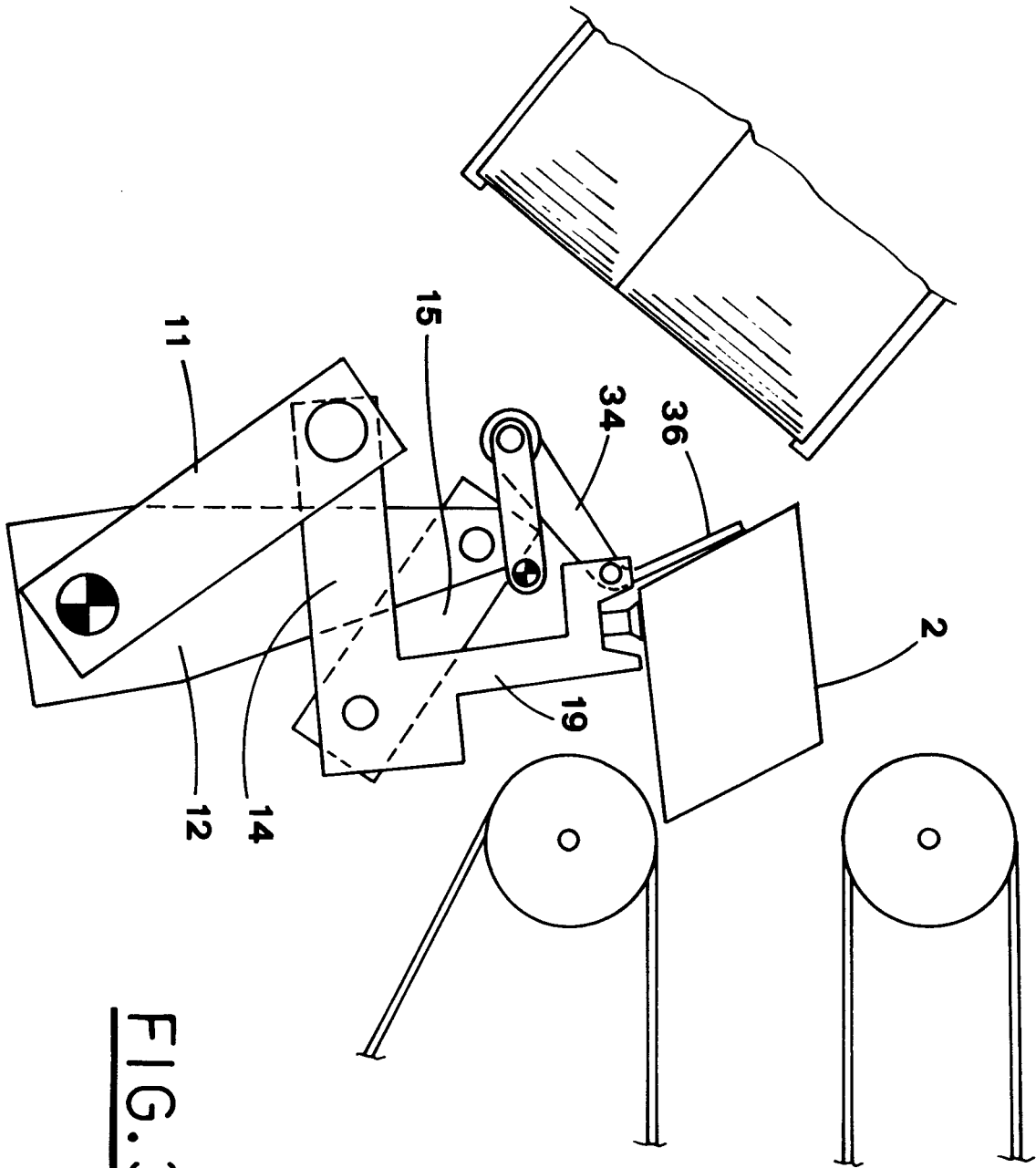


FIG. 3

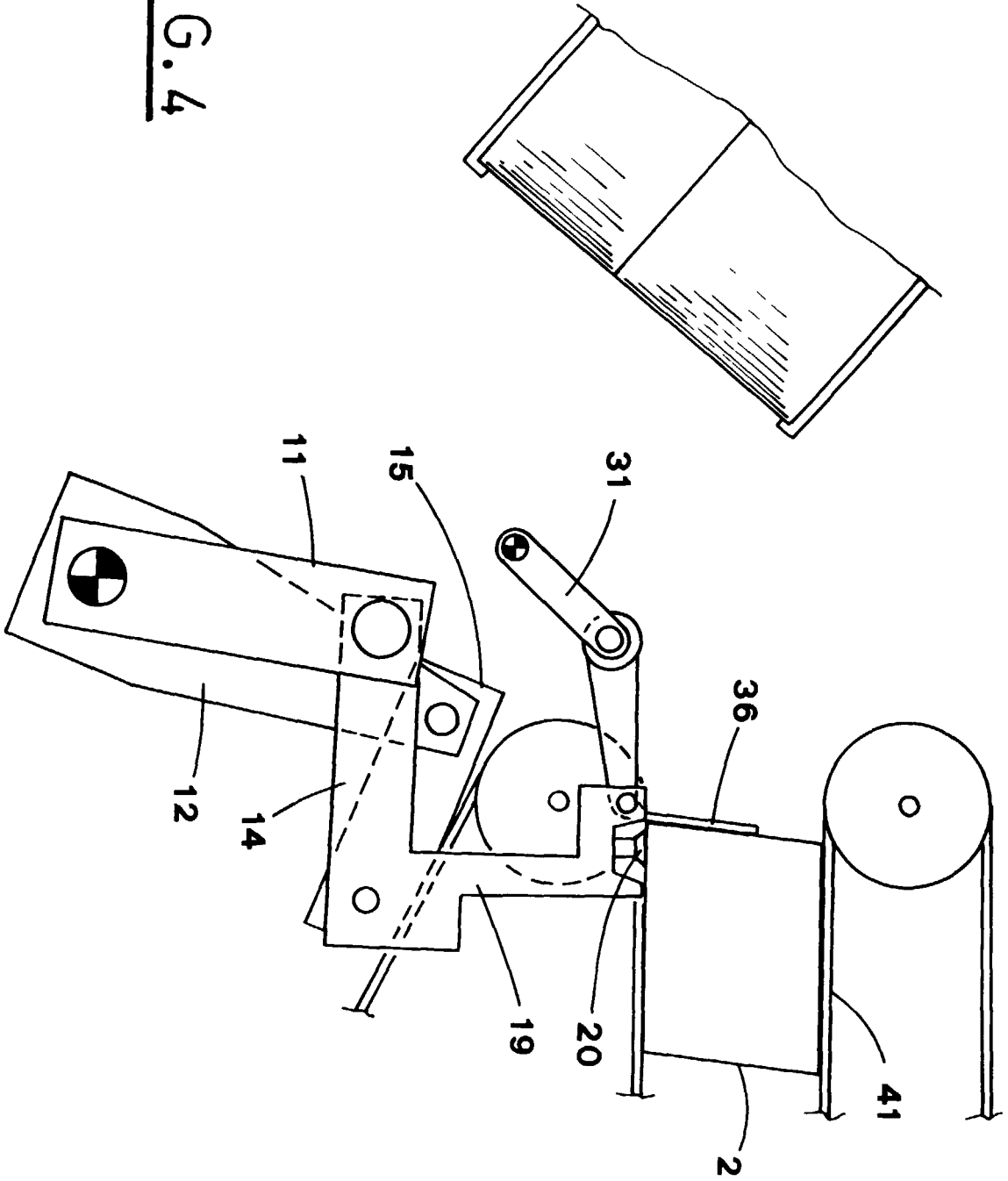


FIG. 4



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 11 4266

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	EP 0 440 940 A (ROBERT BOSCH) 14 August 1991 (1991-08-14) * column 3, line 51 - column 4, line 6; figures 1,2 *	1
A	FR 2 507 565 A (CMS) 17 December 1982 (1982-12-17) * figures 3-5 *	1
A	FR 2 478 576 A (MARCHESINI) 25 September 1981 (1981-09-25)	
		<p>CLASSIFICATION OF THE APPLICATION (Int.Cl.7)</p> <p>B65B43/26 B31B5/76</p> <hr/> <p>TECHNICAL FIELDS SEARCHED (Int.Cl.7)</p> <p>B65B B31B</p>
The present search report has been drawn up for all claims		
Place of search	Date of completion of the search	Examiner
THE HAGUE	2 November 1999	Claeys, H
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p>		<p>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</p> <p>& : member of the same patent family, corresponding document</p>

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 11 4266

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.

02-11-1999

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 440940	A	14-08-1991	DE 4003154 A	08-08-1991
			JP 5004619 A	14-01-1993
			US 5078669 A	07-01-1992
FR 2507565	A	17-12-1982	IT 1146453 B	12-11-1986
			DE 3221862 A	03-02-1983
			GB 2103563 A,B	23-02-1983
			JP 58001625 A	07-01-1983
			US 4583965 A	22-04-1986
FR 2478576	A	25-09-1981	IT 1133252 B	09-07-1986
			DE 3103149 A	10-12-1981
			DE 3153367 C	14-01-1993
			ES 501029 A	16-06-1982