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

(11) EP 3 012 091 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.04.2016 Bulletin 2016/17

(21) Application number: **15190977.7**

(22) Date of filing: **22.10.2015**

(51) Int Cl.:
B29C 65/00 *(2006.01)* ***B65B 19/34*** *(2006.01)*
B65B 51/30 *(2006.01)* ***B65B 9/207*** *(2012.01)*
B65B 9/20 *(2012.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(30) Priority: **24.10.2014 IT MI20141832**

(71) Applicant: **Altopack S.P.A.**
55011 Altopascio (LU) (IT)

(72) Inventor: **PIAZZAROLI, Massimo**
55033 Castelnuovo Di Garfagnana (LU) (IT)

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

(54) GROUP FOR COMPRESSING BAGS IN FORMATION FOR LONG PASTA OR SIMILAR PRODUCTS

(57) A group (1) for compressing bags (200) in formation of long pasta or similar products in a packaging machine (100) is described. The group (1) comprises:
- a conveyor belt (10), which is moved in the feed direction of the succession of doses (5) of pasta, suitable to receive the bags (200) in formation downstream of a welding group (7),
- a first curved plate (11), which is moved vertically by first moving means (12) configured to compress the bags (200) in formation against the conveyor belt (10) by means of the first curved plate (11),
- a second curved plate (21), which is moved horizontally by second moving means (22) configured to translate the second curved plate (21) along a direction opposite to the direction of movement of the conveyor belt (10). (Fig. 1)

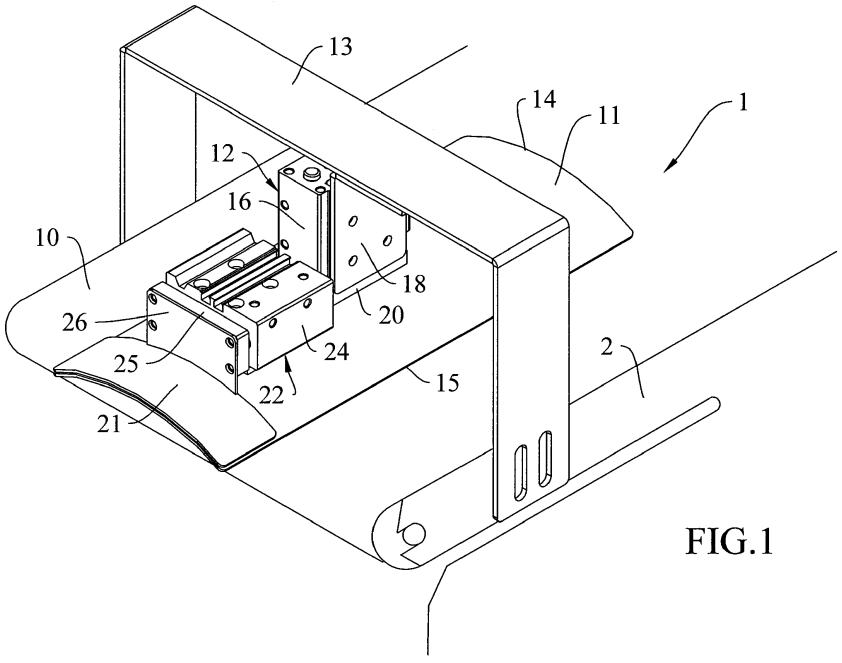


FIG.1

EP 3 012 091 A1

Description

[0001] The present invention relates to a group for compressing bags in formation for long pasta or similar products.

[0002] Packaging machines for long pasta are known, in which the pasta is inserted horizontally inside a casing in formation, consisting of a plastic material film fed along a horizontal path, wherein after having received a dose of pasta, its side flaps are gradually folded downwards and then arranged next to one another under the pasta to form a closed casing about the pasta itself. The closing of the casing is made permanent by a reciprocal longitudinal welding of the two flaps performed at the end of the operation of folding and side-by-side arranging.

[0003] The welding may be performed by means of welding groups which use the heat generated by a current which crosses opposite electric wires (named "welding electrodes") on two parts of the welding group through which the flaps of the film arranged side-by-side are passed.

[0004] Ultrasound welding is another technique, in which an ultrasound generator connected to an electrode named "sonotrode" which cooperates with a fixed locator named "anvil" is used; the ultrasound generator is activated so as to generate a vibration of the sonotrode which causes the welding of two flaps arranged side-by-side to close the bottom of the tubular casing.

[0005] The tubular casing thus formed is then further closed and cut frontally of and behind the dose of pasta by means of a transversal welding and cutting group, which performs a first and a second transversal welding using the heat generated by a current, by ultrasounds or other.

[0006] However, the bags of pasta thus closed have a given amount of air inside, which cannot be removed. The effects of the air that remains inside the bags are known: there will be a decreased capacity of maintaining the organoleptic properties of the product, in this case, long pasta or similar products, and furthermore the bags which are obtained have large dimensions because they are bulkier.

[0007] Given the prior art, it is the object of the present invention to pack long pasta or similar products in bags reducing the amount of air which remains inside the bags.

[0008] According to the present invention, said object is reached by means of a group for compressing bags in formation for long pasta or similar products in a packaging machine, said packaging machine comprising at least one feeder belt of a succession of doses of pasta, at least one longitudinal welding group for the formation of a tubular casing which is further closed and cut, before and after the introduction of the dose of pasta, by at least one transversal welding group, said group being characterized by comprising:

- a conveyor belt, which is moved in the feed direction of the succession of doses of pasta, suitable to receive the bags in formation downstream of said transversal welding group,
- a first curved plate, which is moved vertically by first moving means fixed to a "U"-shaped support frame which is, in turn, fixed above said conveyor belt, said first moving means being configured to compress the bags in formation against the conveyor belt by means of the first curved plate,
- a second curved plate, which is moved horizontally by second moving means which are fixed on said first curved plate, said second moving means being configured to translate the second curved plate along a direction opposite to the direction of movement of the conveyor belt.

[0009] The features and the advantages of the present invention will be apparent from the following detailed description of a practical embodiment thereof, illustrated by way of non-limitative example in the accompanying drawings, in which:

figure 1 shows a perspective view of a group, according to the present invention, for compressing bags in formation for long pasta or similar products in a first working position;
figure 2 shows a further perspective view of the group in said first working position;
figure 3 shows a perspective view of the group in said second working position;
figure 4 shows a further perspective view of the group in said second working position;
figure 5 is a top view of a packaging machine for long pasta or similar products comprising the group in figures 1-5;
figures 6-14 show different steps of operation of the compression group.

[0010] Figure 1 shows a group 1, according to the present invention, for compressing bags 200 in formation of long pasta or similar products in a packaging machine 100.

[0011] The packaging machine 100 comprises a base frame 2 along which a horizontal path for a tubular casing 3 develops, which tubular casing is formed by folding downwards and reciprocally arranging side-by-side the side flaps of a plastic material film initially fed in flat form and then transformed into tubular form by a longitudinal welding group (not shown in the drawings).

[0012] A feeder belt 4 (Fig. 5) longitudinally introduces a succession of doses of long pasta 5 (or similar products) into the aforesaid tubular casing 3.

[0013] Downstream of the longitudinal welding group there is a transversal welding group 7 adapted to transversally weld and cut said tubular casing 3 for separating it into a succession of closed bags 200 separated from one another.

[0014] Figures 6, 9a, 9b, 12 diagrammatically show, by way of example, a circular movement transversal

welding group 7, comprising a pair of welding jaws 8, which turn on two mutually parallel axes 9. The tubular casing 3 is welded and cut when the two welding jaws 8 face each other at the same time.

[0015] The group 1 for compressing the tubular casing 3 comprises a conveyor belt 10 arranged downstream of said transversal welding group 7, said conveyor belt 10 being moved in the direction of advancement of the doses 5 of long pasta, and being adapted to receive bags 200 in formation. In particular, the conveyor belt 10 is configured to receive the tubular casing 3 containing one of the doses 5 of pasta coming from the feeder belt 4 in the range between two transversal welds (and cut) of the tubular casing 3 itself, during the formation of the head and of the tail of the bag 200.

[0016] The group 1 then comprises a first curved plate 11, which is moved vertically by first moving means 12 fixed to a "U"-shaped support frame 13, which is, in turn, fixed above said conveyor belt 10. The first moving means 12 are configured to push said curved plate 11 so as to compress the tubular casing 3 against the conveyor belt 10 in the interval of time between the transversal welding (and cutting) of the head and that of the tail of the bag 200. More in particular, the moving means 12 are adapted to move the first curved plate 11 vertically between a rest position, in which the first curved plate 11 is located at a first height H1 from the surface of the conveyor belt 10, and a position of maximum extension, in which the first curved plate 11 is located at a second height H2 (in contact with the upper surface of the bag 200), said second height H2 being lower than the first height H1.

[0017] The first curved plate 11 (Figs. 7, 10, 13) has a rectangular shape surface with the curvature on the small side 14 of the rectangle, said small side 14 being arranged transversally with respect to said direction of movement of the conveyor belt 10, so as to follow the curved profile of the upper surface of the bag 200. Instead, the length of greater side 15 of the rectangle is comparable to that of a typical bag 200 of long pasta and is arranged longitudinally with respect to the direction of movement.

[0018] For example, said first moving means 12 (Figs. 3-4) comprise a pneumatic piston, in turn substantially comprising a body 16 with at least one rectified cylindrical hole, inside which a piston 17 slides due to the pressure exerted by the introduced air. The body 16 of the pneumatic piston 12 is fixed to the "U"-shaped support frame 13 by means of a "L"-shaped perforated plate 18 and screw means; instead, at one end the piston 17 has a plaque 19 fixed, again by means of screw means, to a further plate 20, which is integral with said first curved plate 11 and positioned superiorly and centrally with respect thereto.

[0019] The group 1 (Figs. 1-4) further comprises a second curved plate 21 horizontally moved by second moving means 22 fixed on said first curved plate 11. The second moving means 22 are adapted to translate the second curved plate 21 longitudinally with respect to the movement direction of the conveyor belt 10, between a rest position, in which the second curved plate 21 is located entirely above the first curved plate 11, and a position of maximum extension, in which the second curved plate 21 constitutes a longitudinal extension of the first curved plate 11.

[0020] Also in this case, said second moving means 22 (Figs. 3-4) comprise a pneumatic piston, in turn, comprising at least one piston 23 which slides inside a body 24 due to the pressure exerted by the introduced air.

[0021] The body 24 of the pneumatic piston 22 is fixed to the first curved plate 11 by means of said further plate 20 and screw means; instead, the piston 23 has a plaque 25 which is fixed, again by means of screw means, to said second curved plate 21 with a perforated flap 26, which branches at right angles therefrom.

[0022] In operation, a succession of doses 5 of long pasta advances on a packaging film, carried by the feeder belt 4 towards the welding units 6, 7 (Figs. 6-8). Taking in consideration a single dose 5 of pasta of the succession, said dose 5 of pasta is enclosed within a tubular casing 3 formed by folding the side flaps of the film, which is then welded by the longitudinal welding group.

[0023] At this point, the tubular casing 3 containing the dose 5 of pasta undergoes a first sealing (and cutting) by a transversal welding group, which separates the bag 200 in formation from the one previously formed. In particular, the first welding (and the cutting) occurs in the moment in which the welding jaws 8, by turning about the respective axes 9, face each other at the same time. The head of the bag 200 in formation is thus formed.

[0024] In the interval of time which elapses between the welding and the formation of the head and of the tail of the bag 200, the tubular casing 3 with the dose 5 of pasta inside is received by the feeder belt 10 and carried to the group 1 for compressing the bag in formation 200.

[0025] At this point, the first curved plate 11 (Figs. 9a-11) descends under the bias of the pneumatic piston 12 starting from said first height H1 towards said second height H2, exerting a pressure on the bag 200 in formation which in the meantime runs underneath the first curved plate 11 carried by the conveyor belt 10. At the same time, the second curved plate 21 is translated by the second pneumatic piston 22, starting from its rest position, in direction opposite to the direction of movement of the conveyor belt 10, thus facilitating the release of air from the tail (which is still open) of the bag 200 in formation.

[0026] Once the second curved plate 21 has reached its maximum extension position, the pneumatic piston is then actuated 22 to return to rest position so as to allow the welding jaws 8 to continue their rotation without interfering with their movement (Figs. 12-14). At this point, the first curved plate 11 is returned to rest position (at height H1) by the pneumatic piston 12 and the successive dose 5 of pasta may be packed.

[0027] With such a group 1, according to the present

invention, for compressing the bags 200 in formation during the step of welding, the air which remains inside the finished bag 200 will be considerably reduced, thus maintaining the organoleptic properties of the product, in this case long pasta or similar products, for a longer time; furthermore, the bags which are obtained will have minimum dimensions.

Claims

1. Group (1) for compressing bags (200) in formation, in a packaging machine (100) for long pasta or similar products, said packaging machine (100) comprising at least one feeder belt (4) of a succession of doses (5) of pasta, at least one longitudinal welding group for the formation of a tubular casing (3) which is further closed and cut, before and after the introduction of the dose (5) of pasta, by at least one transversal welding group (7), said group (1) being **characterized by** comprising:

   - a conveyor belt (10), moved in the feed direction of the succession of doses (5) of pasta, suitable to receive the bags (200) in formation downstream of said transversal welding group (7),
   - a first curved plate (11), which is moved vertically by first moving means (12) fixed to a "U"-shaped support frame (13) which is in its turn fixed above said conveyor belt (10), said first moving means (12) being configured to compress the bags (200) in formation against the conveyor belt (10) by means of the first curved plate (11),
   - a second curved plate (21) horizontally moved by second moving means (22) which are fixed on said first curved plate (11), said second moving means (22) being configured to translate the second curved plate (21) along the direction of movement of the conveyor belt (10).

2. Group (1) according to claim 1, **characterized in that** said first moving means (12) are configured to vertically move the first curved plate (11) between a rest position, in which the first curved plate (11) is located at a first height (H1) from the surface of the conveyor belt (10), and a position of maximum extension, in which the first curved plate (11) is located at a second height (H2) (in contact with the upper surface the bag (200)), said second height (H2) being lower than the first height (H1).

3. Group (1) according to claims 1 or 3, **characterized in that** said first moving means (12) comprise a pneumatic piston in turn comprising a body (16) with at least one rectified cylindrical hole, inside which a piston (17) slides due to the pressure exerted by the air introduced, said body (16) being fixed to the "U"-shaped support frame (13) by means of a "L"-shaped perforated plate (18), at one end said piston (17) having a plaque (19) fixed to a further plate (20) which is integral with said first curved plate (11) and positioned superiorly and centrally with respect to the latter.

4. Group (1) according to claim 1, **characterized in that** said second moving means (22) are configured to translate the second curved plate (21) longitudinally with respect to the movement direction of the conveyor belt (10), between a rest position, in which the second curved plate (21) is located entirely above the first curved plate (11), and a position of maximum extension, in which the second curved plate (21) is a longitudinal extension of the first curved plate (11).

5. Group (1) according to claims 1 or 4, **characterized in that** said second moving means (22) comprise a pneumatic piston in turn comprising at least one piston (23) which slides inside a body (24) due to the pressure exerted by the air introduced, said body (24) being fixed to the first curved plate (11) by means of said further plate (20), at one end said piston (23) having a plaque (25) fixed to said second curved plate (21) with a perforated flap (26) which branches at right angles from the latter.

6. Packaging machine (100) for packaging long pasta, or similar products, comprising a group (1) for compressing bags (200) in formation as claimed in claims 1 to 5.

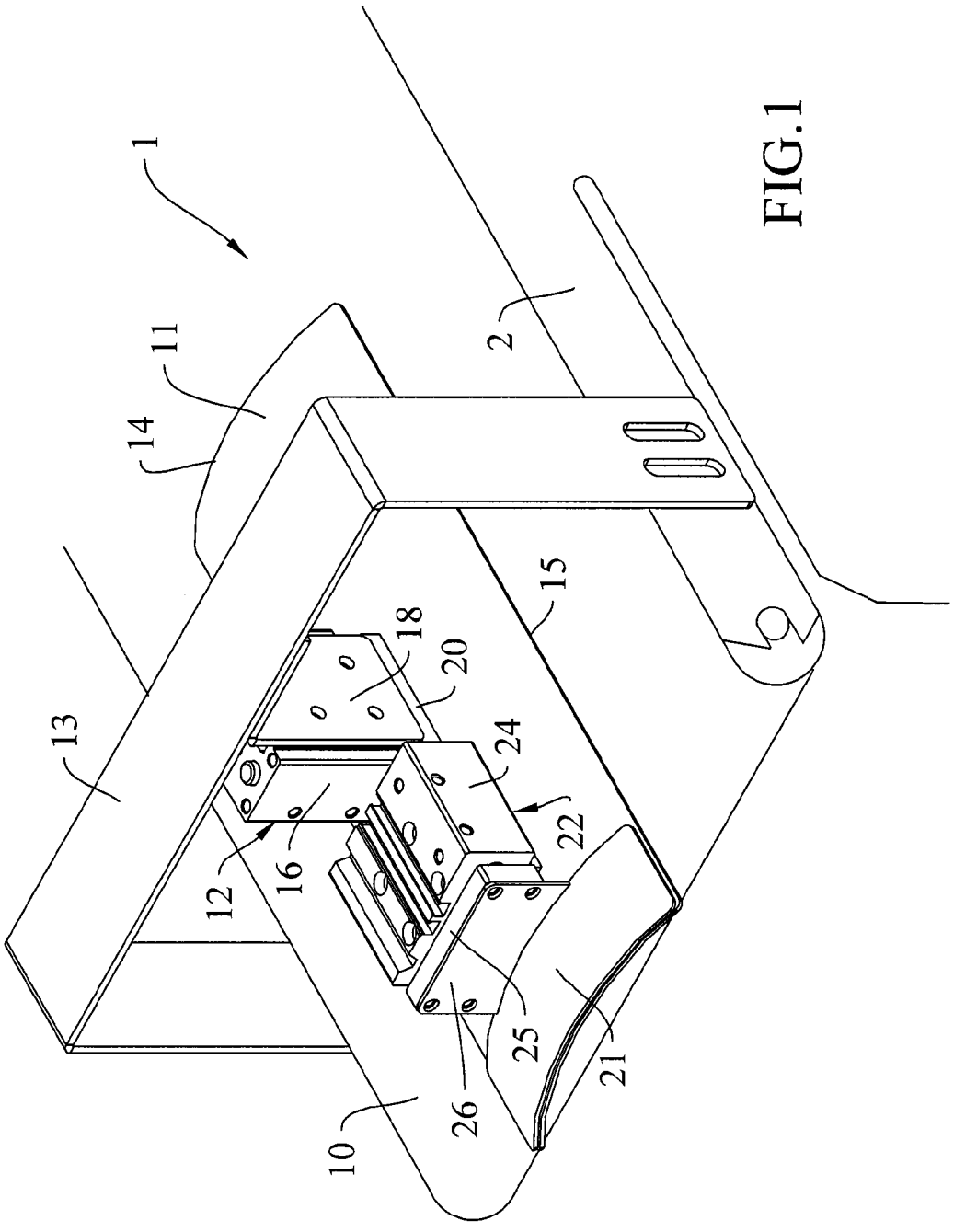


FIG.1

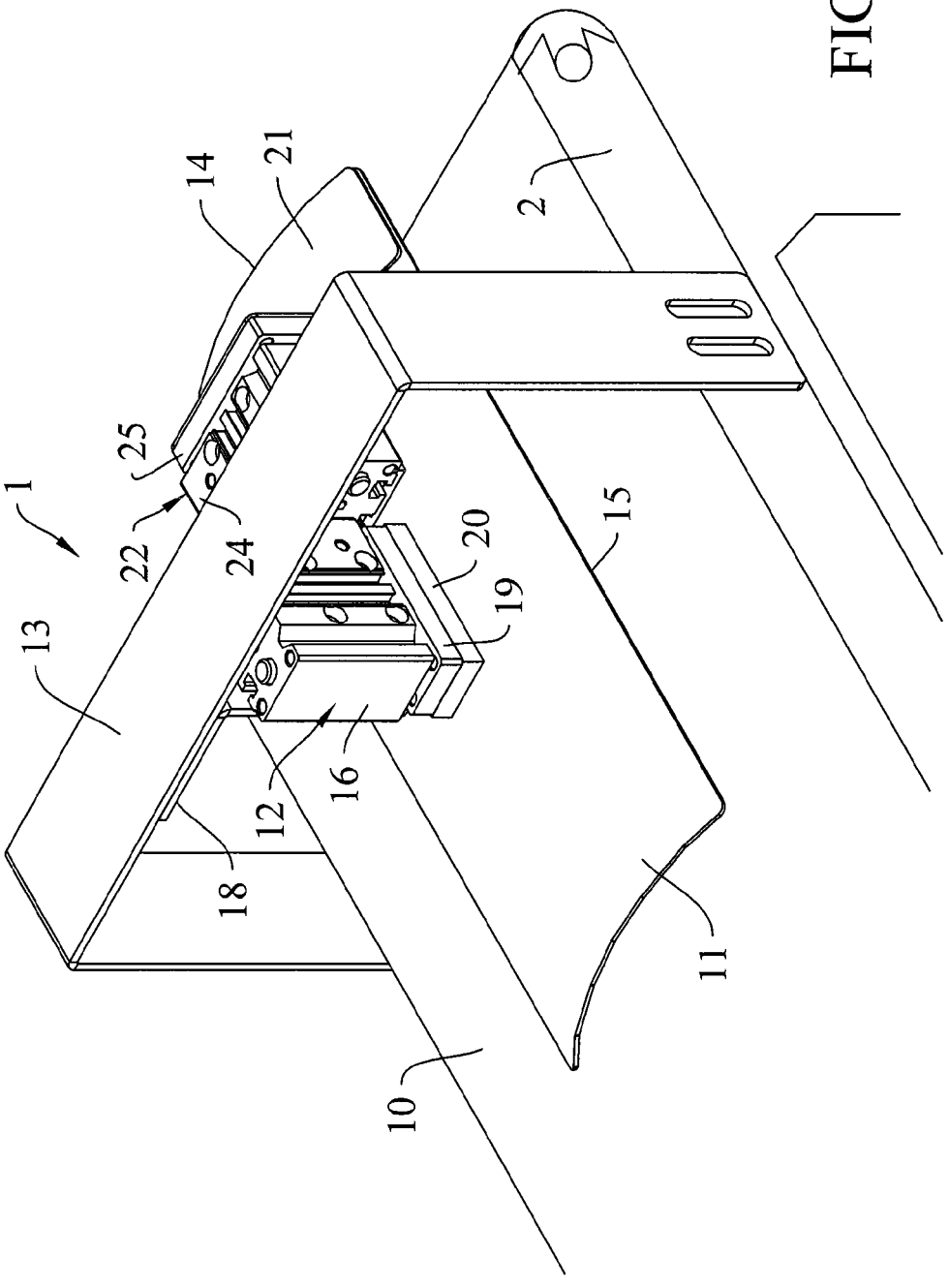


FIG.2

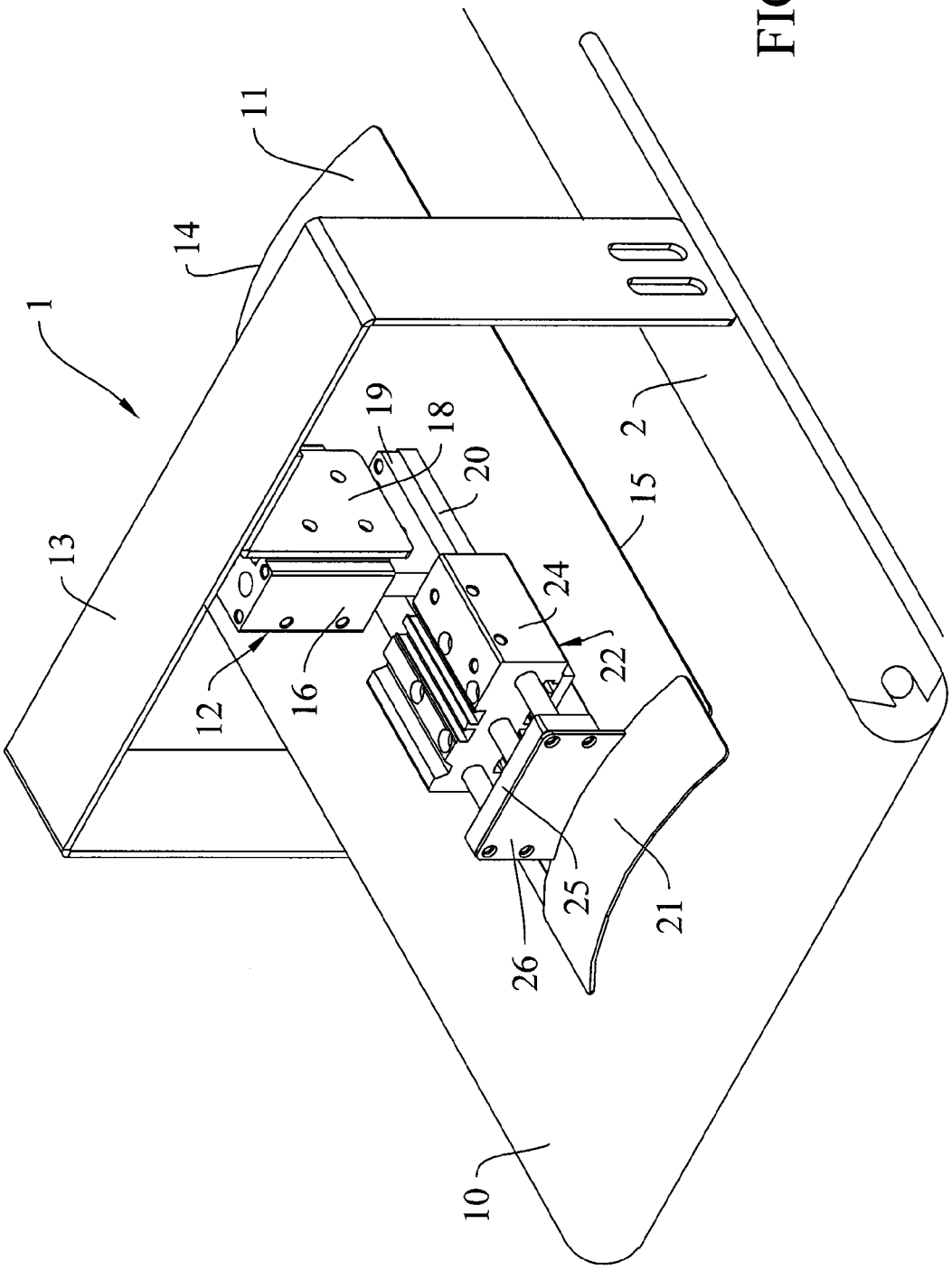


FIG.3

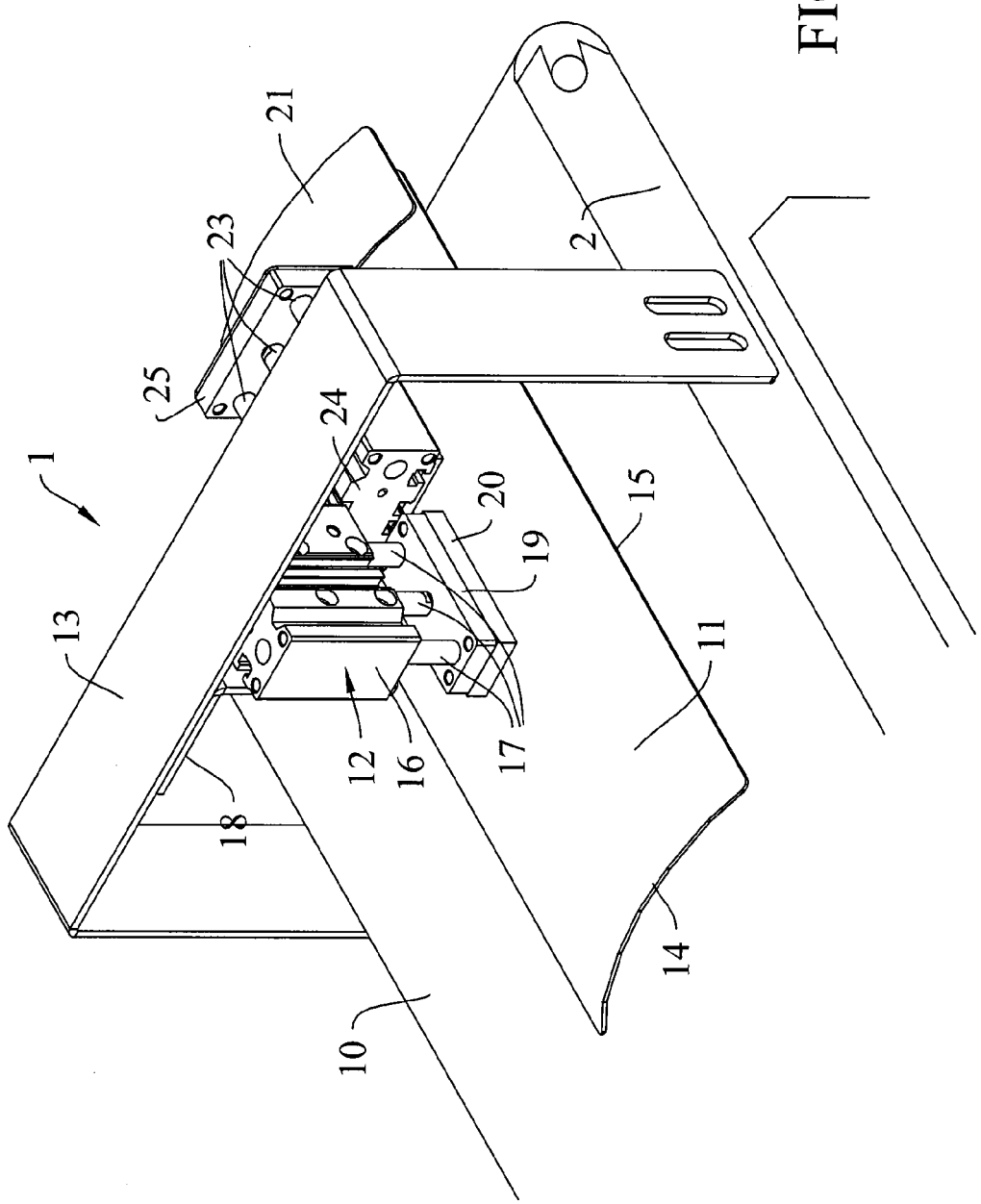
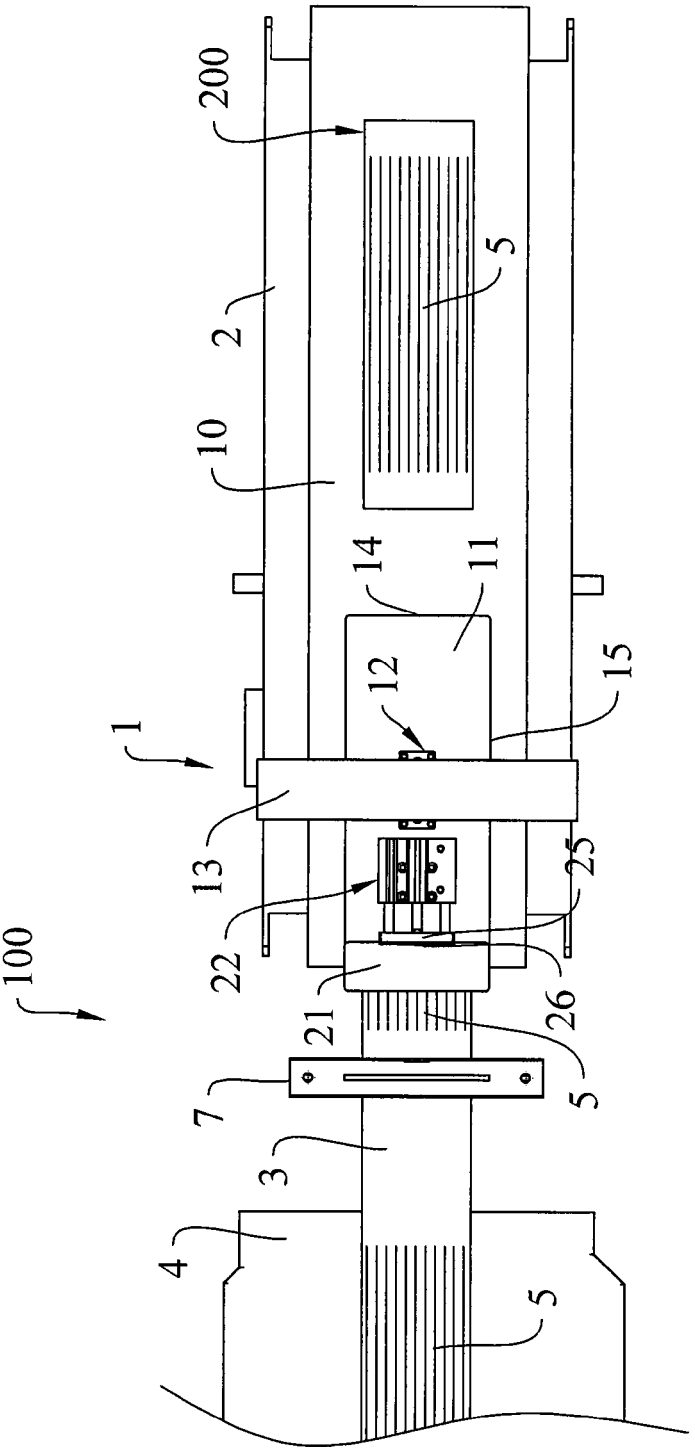


FIG.4

FIG.5



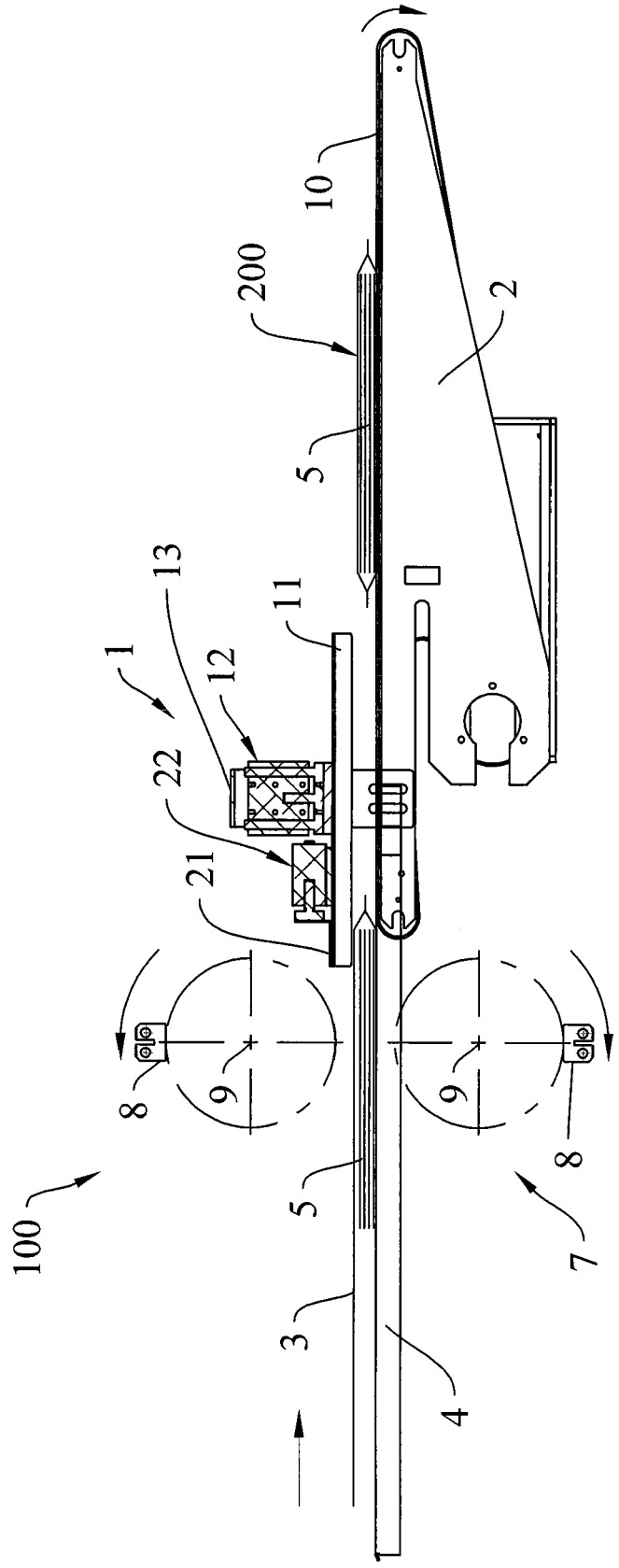


FIG.6

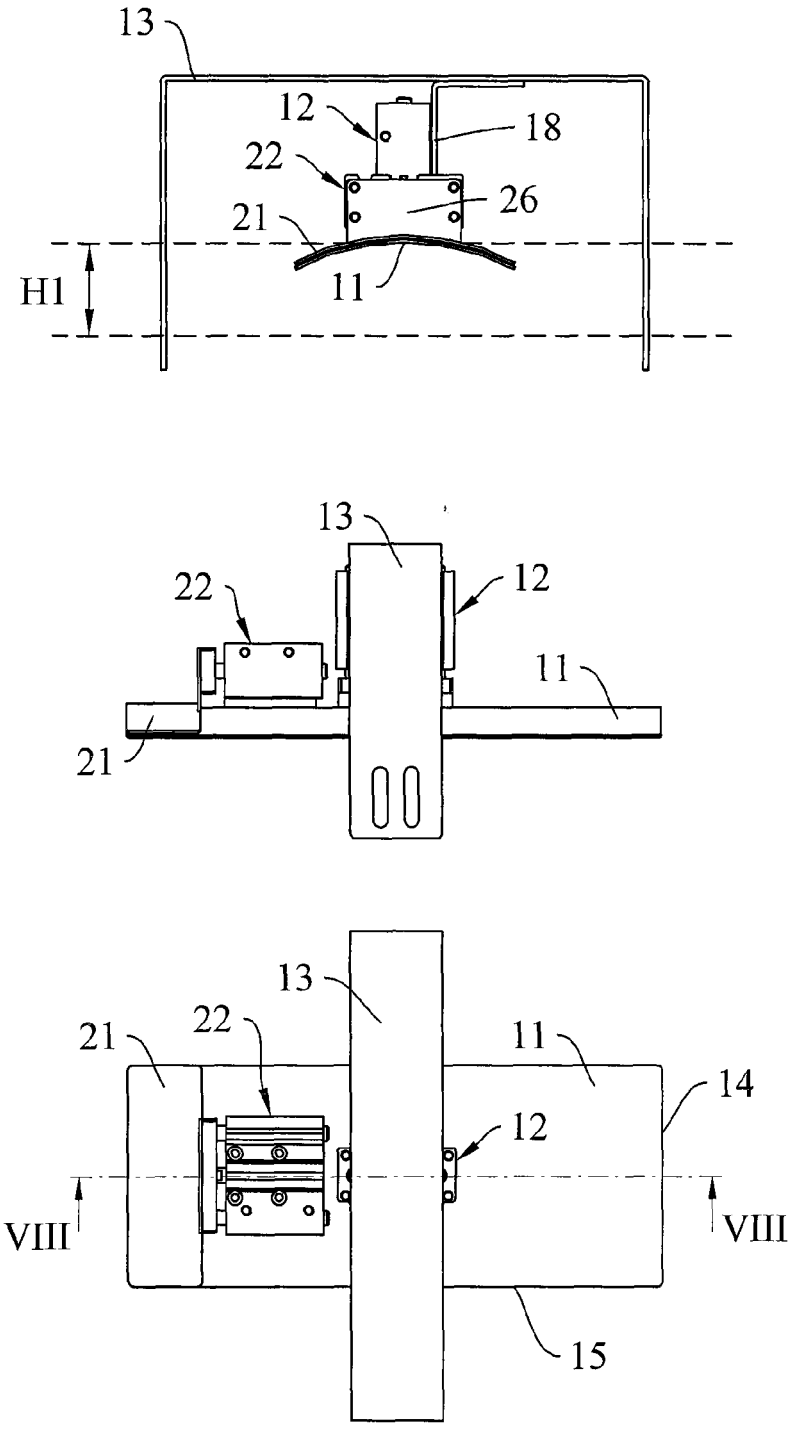


FIG.7

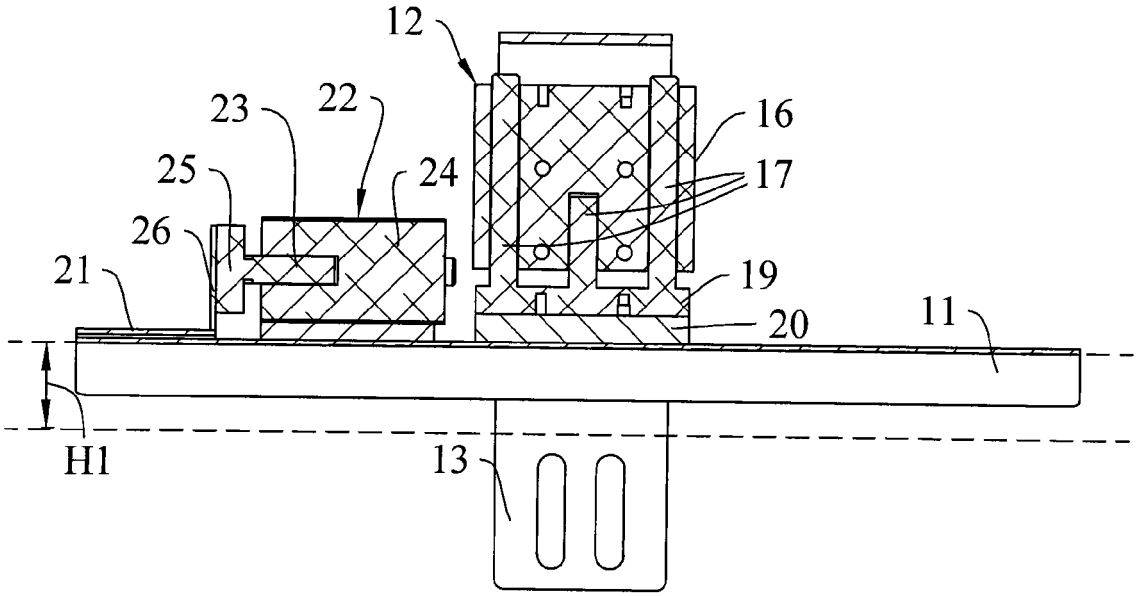


FIG.8

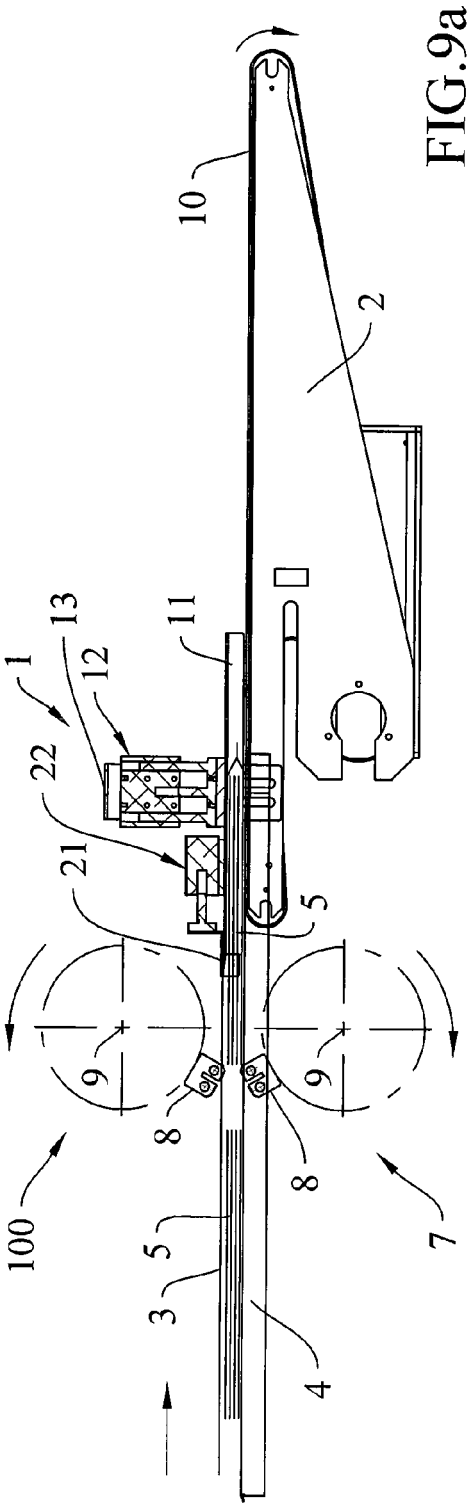


FIG.9a

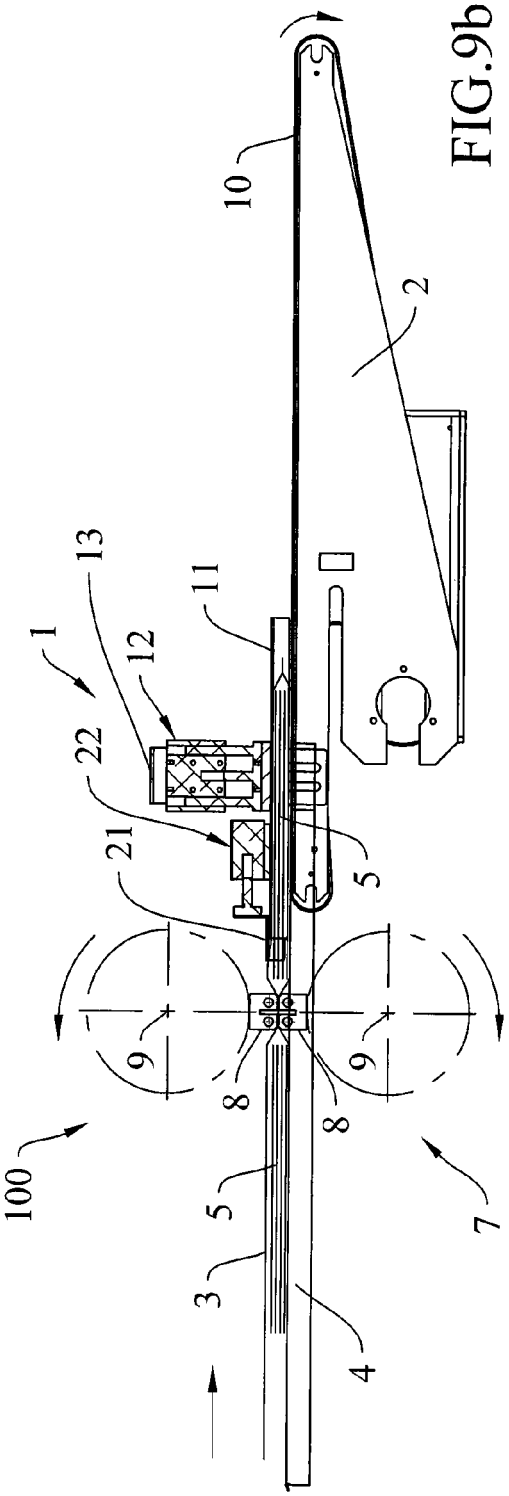


FIG.9b

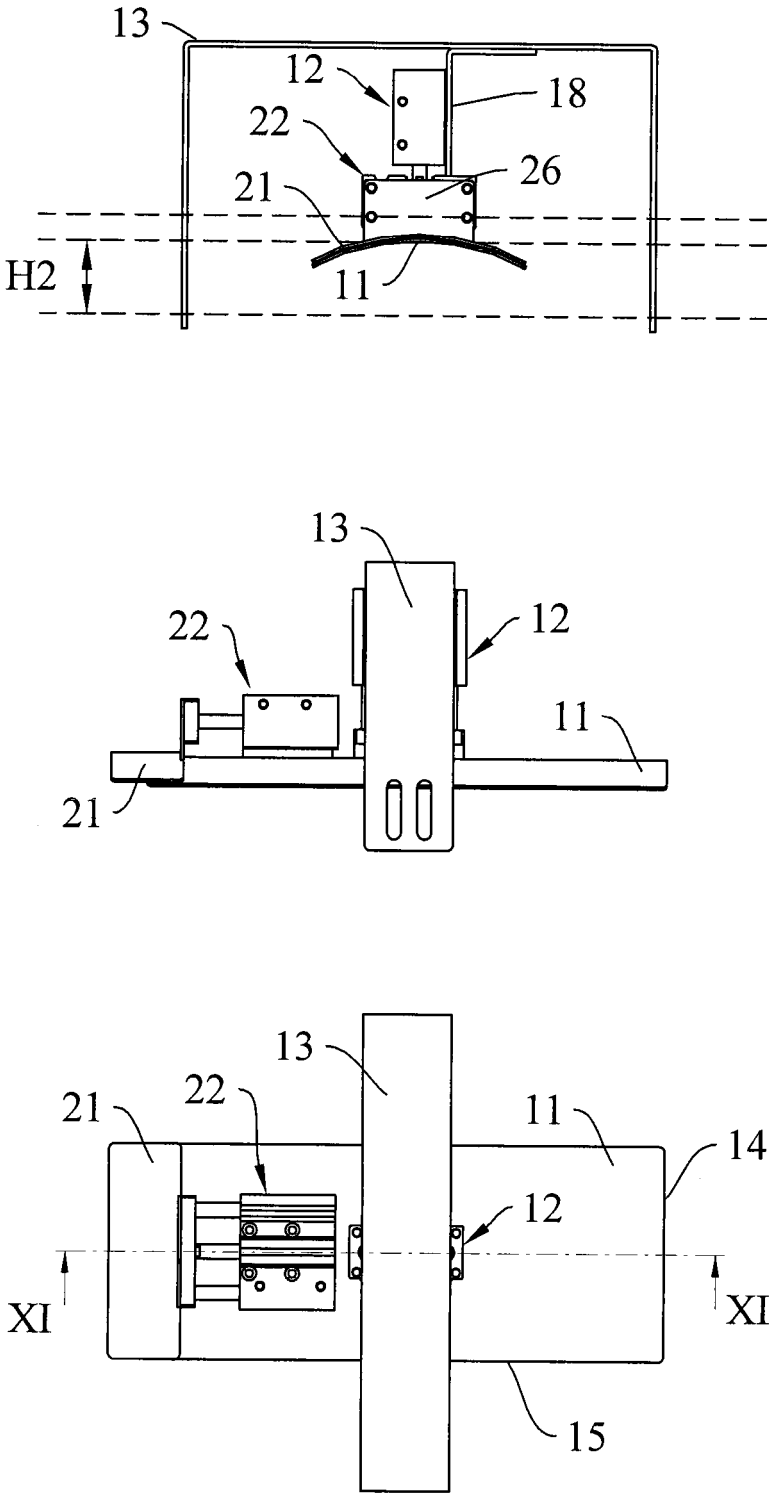


FIG.10

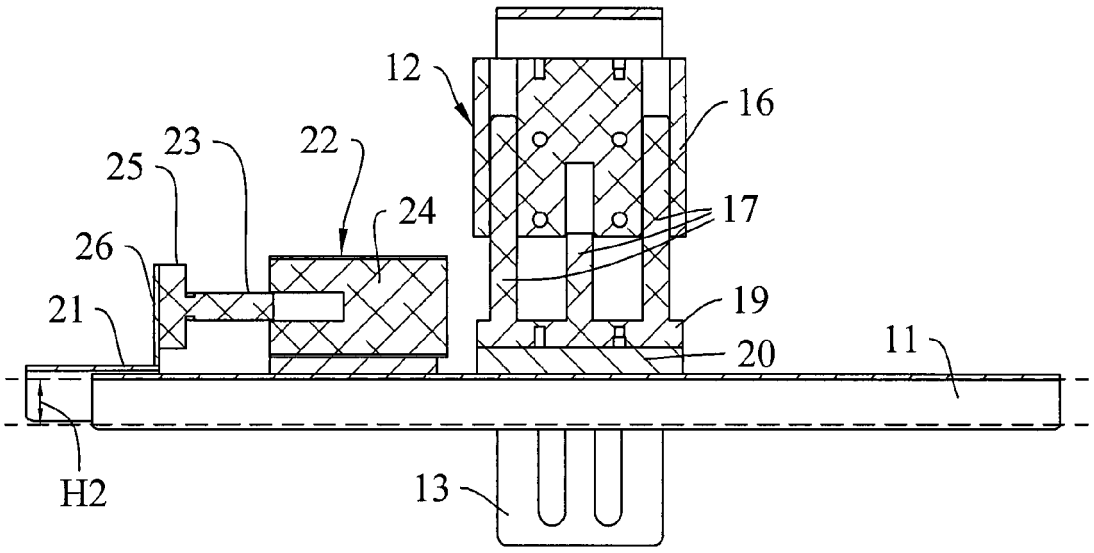


FIG.11

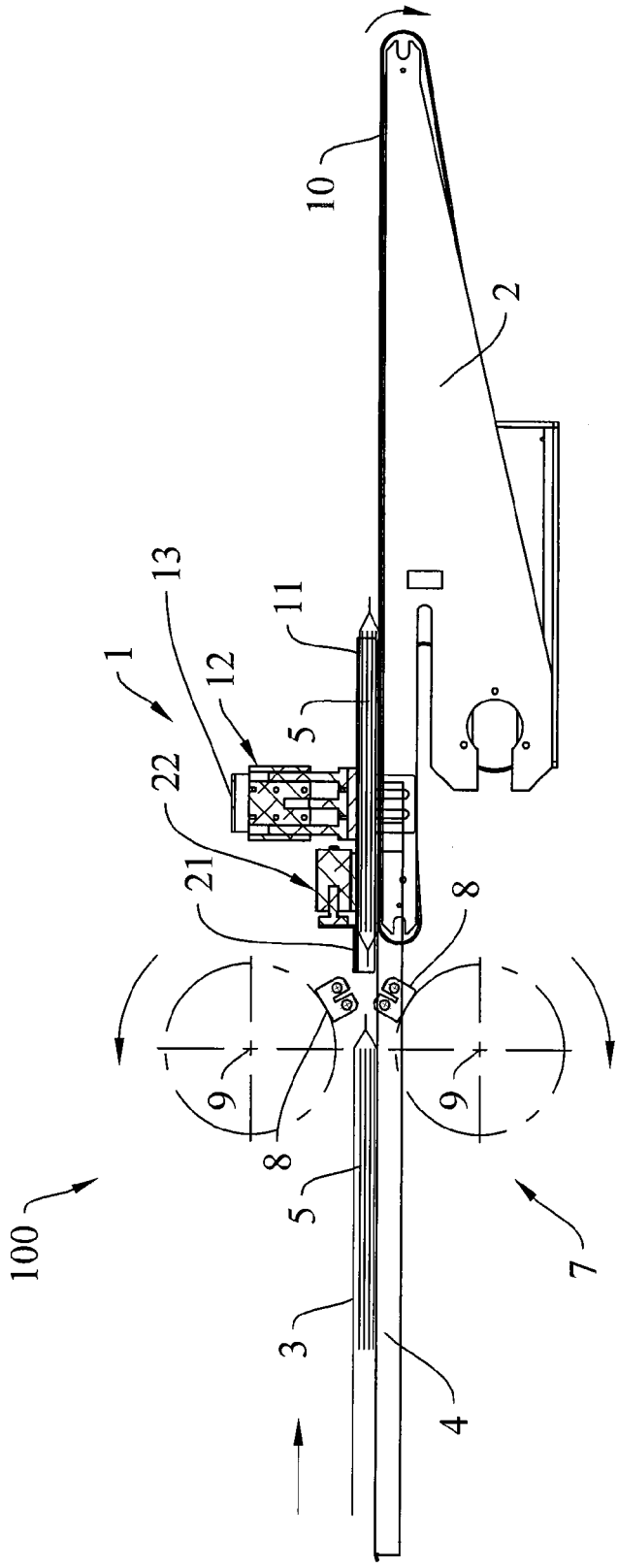


FIG.12

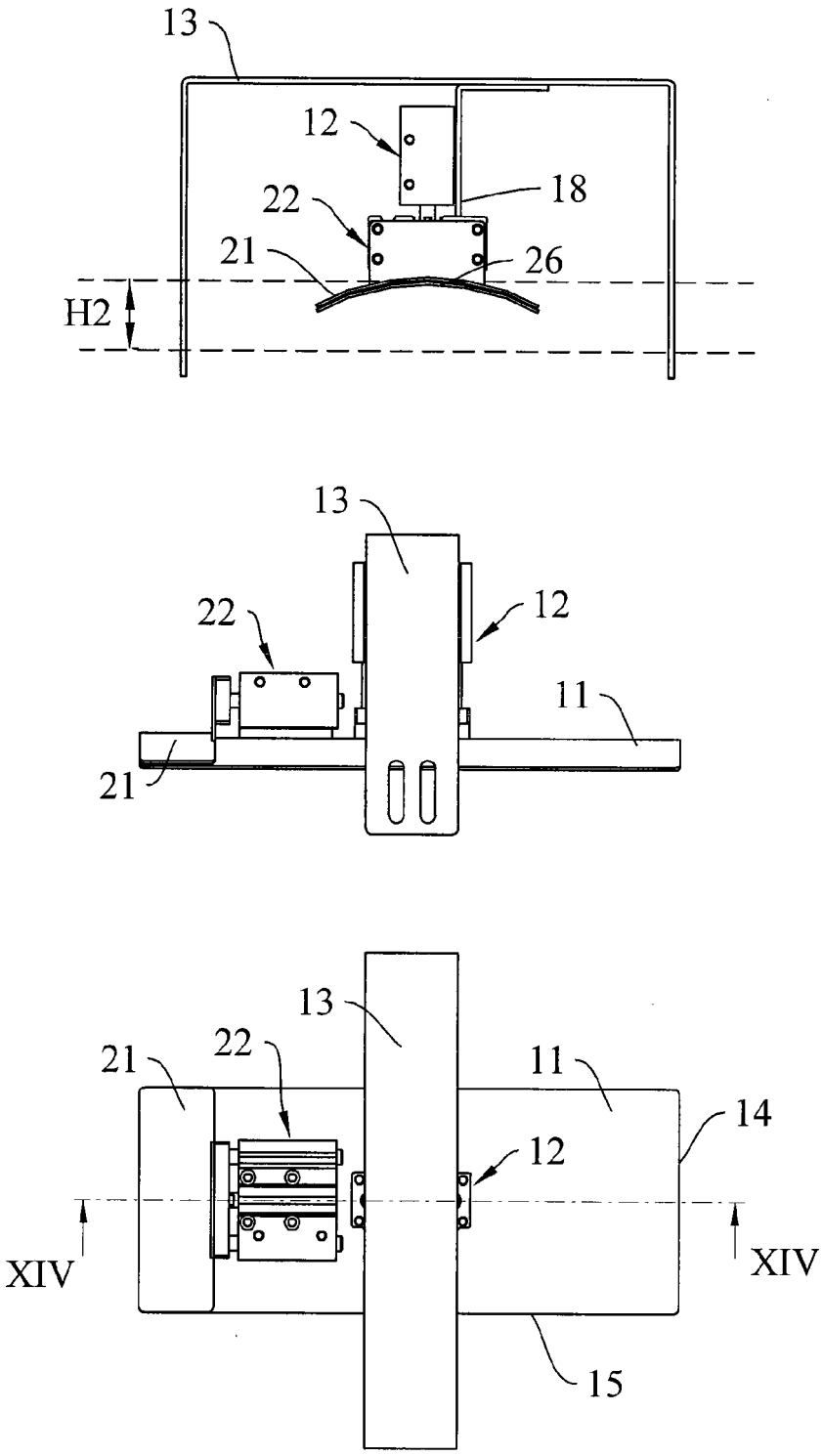


FIG.13

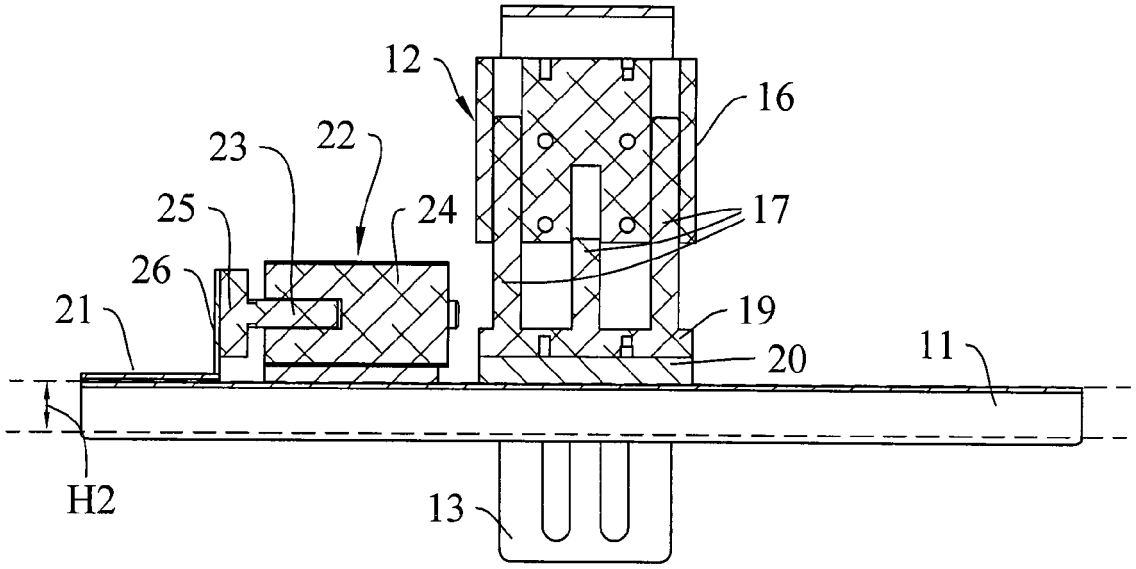


FIG.14

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 15 19 0977

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 860 359 A1 (SASIB PACKAGING ITALIA SRL [IT]) 26 August 1998 (1998-08-26) * the whole document *	1-6	INV. B29C65/00 B65B19/34 B65B51/30 B65B9/207 B65B9/20
A	EP 2 248 723 A1 (MARCHESINI GROUP SPA [IT]) 10 November 2010 (2010-11-10) * the whole document *	1-6	
A	WO 2009/143303 A1 (KELLOG CO [US]; OURS DAVE [US]; JUNTUNEN SHARI [US]) 26 November 2009 (2009-11-26) * the whole document *	1-6	
A	US 5 170 609 A (BULLOCK LARRY J [US] ET AL) 15 December 1992 (1992-12-15) * the whole document *	1-6	
A	CA 2 414 109 A1 (PREMIER TECH 2000 LTEE [CA]) 12 June 2004 (2004-06-12) * the whole document *	1-6	
A	WO 2007/140603 A1 (LIQUI BOX CANADA INC [CA]; FERGUSSON STUART [CA]; GODFROY LARIN [CA];) 13 December 2007 (2007-12-13) * the whole document *	1-6	TECHNICAL FIELDS SEARCHED (IPC) B29C B65B
A	US 4 924 656 A (KOVACS LLOYD [US] ET AL) 15 May 1990 (1990-05-15) * figures 47-50 *	1-6	
A	DE 10 2004 011606 A1 (PFANNENSCHWARZ WILLI [DE]) 6 October 2005 (2005-10-06) * the whole document *	1-6	
A	WO 2010/064093 A2 (PAVAN S R L [IT]; MORELLATO LUCIANO [IT]; MARINI ROBERTO [IT]; CAVAGNI) 10 June 2010 (2010-06-10) * the whole document *	1-6	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 November 2015	Yazici, Baris

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)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 15 19 0977

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2011/104168 A1 (ALTOPACK S P A [IT]; BADIANI LUCA [IT]; CAMBI MARCO [IT]) 1 September 2011 (2011-09-01) * the whole document * -----	1-6	

TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 November 2015	Yazici, Baris

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 15 19 0977

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.

18-11-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0860359 A1	26-08-1998	BR 9800644 A	14-09-1999
		DE 69808530 D1	14-11-2002
		DE 69808530 T2	18-06-2003
		EP 0860359 A1	26-08-1998
		ES 2182257 T3	01-03-2003
		IT FI970029 A1	21-08-1998
EP 2248723 A1	10-11-2010	AT 532711 T	15-11-2011
		EP 2248723 A1	10-11-2010
		ES 2376994 T3	21-03-2012
		US 2010281832 A1	11-11-2010
WO 2009143303 A1	26-11-2009	US 2009288370 A1	26-11-2009
		US 2011209444 A1	01-09-2011
		WO 2009143303 A1	26-11-2009
US 5170609 A	15-12-1992	CA 2059217 A1	23-07-1992
		US 5170609 A	15-12-1992
CA 2414109 A1	12-06-2004	NONE	
WO 2007140603 A1	13-12-2007	AT 551267 T	15-04-2012
		BR PI0712187 A2	06-03-2012
		CA 2656251 A1	13-12-2007
		EP 2029434 A1	04-03-2009
		ES 2384689 T3	11-07-2012
		US 2008209864 A1	04-09-2008
		US 2010276450 A1	04-11-2010
		WO 2007140603 A1	13-12-2007
US 4924656 A	15-05-1990	NONE	
DE 102004011606 A1	06-10-2005	NONE	
WO 2010064093 A2	10-06-2010	NONE	
WO 2011104168 A1	01-09-2011	EP 2539230 A1	02-01-2013
		ES 2504092 T3	08-10-2014
		WO 2011104168 A1	01-09-2011

EPO FORM P0459

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