

(19)



(11)

EP 2 676 908 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

25.12.2013 Bulletin 2013/52

(51) Int Cl.:

B65H 23/025 (2006.01)

B65H 23/188 (2006.01)

B65H 23/16 (2006.01)

D06B 3/12 (2006.01)

(21) Application number: **12172990.9**

(22) Date of filing: **21.06.2012**

(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

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(54) Apparatus for processing a fabric tape

(57) An apparatus (100) for processing a tape (900) with a plurality rows of hooks or a plurality rows of eyes along a path. The apparatus (100) includes a body (101) having a roller (201 to 203 and 306A to 310B) along the path, the roller (201 to 203 and 306A to 310B) being rotatable relative to the body (101) for moving a said tape (900) along its lengthwise direction. The apparatus (100)

further includes a tensioning device (204, 205 and 301 to 304) along the path, the tensioning device (204, 205 and 301 to 304) being cooperable with the roller (201 to 203 and 306A to 310B) to exert a tensioning force along length of said tape (900); and a monitoring device (404 / 404A and 4048) along the path to determine spacing between successive rows of hooks or eyes.

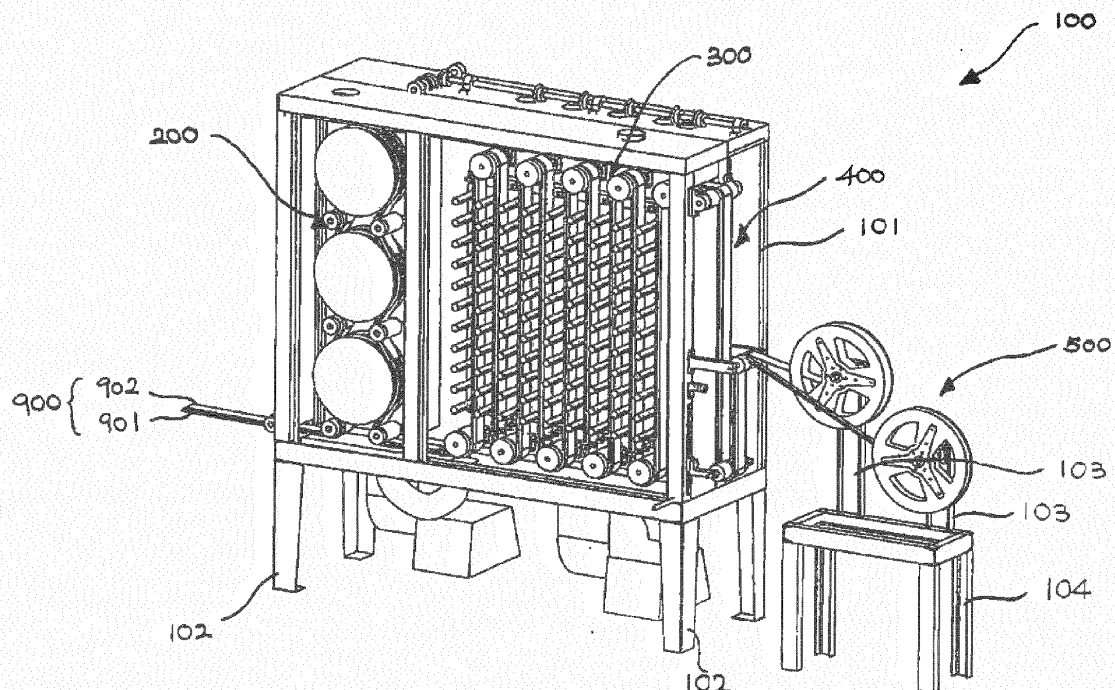


FIG. 1

Description

[0001] The present invention relates to a device for processing a fabric tape, in particular a tape of fastener.

5 BACKGROUND OF THE INVENTION

[0002] Treatment of fabric, such as dyeing, involves soaking the fabric into a basin of heated colored solution. After dyeing, the fabric is wet and deformed. Uncontrollable shrinkage almost certainly occurs. It becomes necessary to process the dyed fabric, for example drying and stretching, before it can be utilized industrially.

10 **[0003]** This is especially important when the fabric is in the form of a tape with rows of fasteners sewed onto it because the spacing between successive fasteners has to be maintained generally the same. After dyeing, shrinkage of the tape at different degree may occur at different points along its length, which can be problematic.

[0004] The invention seeks to mitigate or at least alleviate such problems by providing an apparatus for processing a fabric tape.

15 SUMMARY OF THE INVENTION

[0005] According to the invention, there is provided an apparatus for processing a tape with a plurality rows of hooks or a plurality rows of eyes along a path comprising: a body having a roller along the path, the roller being rotatable relative to the body for moving a said tape along its lengthwise direction; a tensioning device along the path, the tensioning device being cooperable with the roller to exert a tensioning force along length of said tape; the apparatus includes a monitoring device along the path to determine spacing between successive rows of hooks or eyes.

[0006] Preferably, the monitoring device is adapted to output determined spacing between successive rows of hooks or eyes in a readable form to a processor for calibration.

25 **[0007]** More preferably, the tensioning device is moveable relative to the curved surface for changing tangential distance between the tensioning device and the curved surface and hence change the tensioning force exertable along length of said tape.

[0008] Yet more preferably, the processor is adapted to output a signal after calibration in response to which the tensioning device is adapted to move relative to the curved surface for changing the tangential distance.

30 **[0009]** Advantageously, the tensioning device is cooperable with the roller to exert a variable tensioning force along length of said tape, and wherein the tensioning device and/or the roller is/are rotatable at a variable torque to bring about movement of said tape at a variable speed along its length.

[0010] More advantageously, the processor is adapted to output a signal after calibration to bring about a change in the variable torque basing on result of the calibration.

35 **[0011]** Yet more advantageously, the monitoring device comprises first and second parts for taking first and second measurements and outputting the measurements to the processor for calculation and calibration.

[0012] It is preferable that the apparatus as claimed in claim 18, wherein the first measurement comprises information about length of at least part of said tape passing by within a given period of time and the second measurement comprises information about number of rows of hooks or eyes in the length within that same period of time.

40 **[0013]** In a second aspect of the invention there is provided an apparatus for processing a fabric tape comprising: a body having a roller being rotatable relative to the body for moving a said tape along its lengthwise direction; and a tensioning device which is cooperable with the roller to exert a tensioning force along length of said tape; and the apparatus includes means for heating at least part of the roller to an elevated temperature for heating said tape engaged with the roller.

45 **[0014]** Preferably, the roller has a surface for engaging said tape and being heatable to the elevated temperature for heating said tape engaged with the surface.

[0015] More preferably, the surface has a plurality of apertures through which the heating means passes.

[0016] Yet more preferably, the heating means comprises a heated medium.

[0017] It is preferable that the heated medium comprises heated gas.

50 **[0018]** It is advantageous that the apparatus further comprises means for drying said tape,

[0019] Preferably, the drying means projects from the body and has a plurality of apertures.

[0020] In a further aspect of the invention, there is provided a method of processing a tape with a plurality of rows of hooks or a plurality of rows of eyes along a path comprising the steps of tensioning said tape by exerting a tensioning force on said tape, determining spacing between successive rows of hooks or eyes and adjusting the tensioning force exertable on said tape to adjust the spacing between said successive rows of hooks or eyes.

55 **[0021]** In another aspect of the invention, there is provided a method of processing a fabric tape comprising the steps of moving said tape along its lengthwise direction on a roller, tensioning said fabric tape by exerting a tensioning force on said tape, heating at least part of the roller to an elevated temperature for heating said tape engaged with the roller.

BRIEF DESCRIPTION OF DRAWINGS

[0022] The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of an embodiment of an apparatus for processing fabric tape in accordance with the invention;

Figure 2 is a top plan view of the apparatus of Figure 1;

Figure 3 is a perspective view of a device for removing water from a disc of fabric tape wound into a disc, before the tape is processed by the apparatus of Figure 1;

Figure 4A is an enlarged view of a first part of the apparatus of Figures 1 and 2;

Figure 4B is an enlarged view of a portion of the part in Figure 4A, and said portion being shown partially;

Figure 4C is an enlarged view of a surface of a roller of the first part in Figure 4A;

Figure 5A is an enlarged view of a second part of the apparatus in Figures 1 and 2;

Figure 5B is an enlarged view of a portion of the second part in Figure 5A;

Figure 5B-1 is an enlarged view of a circled portion in Figure 5B;

Figure 5C is an enlarged view of another portion of the second part in Figure 5A, said portion being shown partially;

Figure 6A is an enlarged view of a third part of the apparatus in Figures 1 and 2;

Figure 6B is an enlarged view of a first portion of the third part in Figure 6A;

Figure 6C is an enlarged view of a second portion of the third part in Figure 6A; and

Figure 7 is an enlarged view of a fourth part of the apparatus in Figures 1 and 2.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0023] Referring to the drawings, see for example Figures 1, 2 and 3, there is shown an apparatus 100 embodying the invention for processing a fabric tape 900. In the preferred embodiment, the apparatus 100 is adapted to process two fabric tapes 901 and 902 simultaneously or separately, one with rows of hook fasteners and the other with rows of eye fasteners sewed thereon. The apparatus 100 has a body 101 in the form of a frame supporting first, second and third parts 200, 300 and 400 of the apparatus 100. A fourth part 500 is provided adjacent the third part 400 and is preferred to be supported separately. A fifth part 600 as shown in Figure 3 is provided separately.

[0024] In a different embodiment, the apparatus 100 may include any of the first to fifth parts in any combination. The first part 200 is for ironing and stretching said fabric tape 900. The second part 300 is for stretching and drying said fabric tape 900. The third part 400 is for taking readings indicative of spacing between successive rows of hook or eye fasteners on said tape 900. The fourth part 500 is for collecting said tape 900 after processing. The fifth part 600 is for partial removal of liquid contained in said fabric tapes 901 and 902 before the fabric tapes are processed by the first part 200 of the apparatus 100.

[0025] In more detail, the frame 101 is made of metal or preferably stainless steel supported on four legs 102. Pipes connected to different parts of the apparatus 100 run in space underneath the frame 101. In the preferred embodiment, the first, second and third parts 200, 300 and 400 of the apparatus 100 are stowed within the frame 101. The fourth part 500 is supported separately on frames 103 which extend upward from top of a table 104. The fifth part 600 is seated on its own.

[0026] Referring to Figure 3, there is shown the fifth part 600 of the apparatus 100. The fifth part 600 is a centrifuge that spins one or more disc 601 of said fabric tape 901 or 902 around a fixed axis to thereby remove some of the liquid contained in said tapes 901 or 902. The liquid content in said tapes 901 or 902 may be reduced to around 35% - 45%. Then said tapes 901 and 902 are introduced into the first part 200 of the apparatus 100.

[0027] Referring to Figures 4A, 4B and 4C, the first part 200 has three rollers 201, 202 and 203 aligned vertically along same axis and evenly spaced from one another. Each of these rollers 201 to 203 is positioned adjacent to a pair of tensioning devices 204 and 205. These tensioning devices 204 and 205 are placed in the spacing between the rollers 201, 202 and 203. Each of these tensioning devices 204 and 205 which form a pair is placed at the same height, and relatively moveable towards and away from each other, preferably horizontally. The rollers 201, 202 and 203 and the tensioning devices 204 and 205 are rotatably mounted on the frame 101. Said fabric tapes 901 and 902 are moveable along their length over the rollers 201, 202 and 203 and the tensioning devices 204 and 205 as they rotate. As shown in Figure 1, the fabric tape 900 runs generally in a form of "8". The tensioning devices 204 and 205 are cooperable with the rollers 201 to 203 to exert a tensioning force along length of said fabric tapes 901 and 902. Movement of the tensioning devices 204 and 205 towards each other increases the tensioning force exertable along length of said fabric tapes 901 and 902 by increasing the tangential distance between the tensioning devices 204 and 205 and the rollers 201 to 203. Movement of the tensioning devices 204 and 205 away from one another decreases the tensioning force exertable along length of said fabric tapes 901 and 902 by decreasing the tangential distance between the tensioning devices 204 and 205 and the rollers 201 to 203.

[0028] In the preferred embodiment, the first part 200 of the apparatus 100 is adapted to process a hook tape and an eye tape simultaneously.

[0029] The rollers 201 to 203 are adapted to exert a tensioning force on said fabric tapes 901 and 902 transverse to the length of said tape 900. The rollers 201 to 203 each has two curved or bulging surfaces 206A and 206B (see Figure 4C) for engaging the hook tape 901 and the eye tape 902 respectively. The surfaces 206A and 206B curve along a direction substantially traverse the length of said hook and eye tapes 901 and 902. Said hook and eye tapes 901 and 902 tend to mount over and spread across the curved surfaces 206A and 206B, particularly when said hook and eye tapes 901 and 902 are wet and heavy. The curved surfaces 206A and 206B curves along a direction substantially traverse the length of the tape. The rollers 201 to 203 are rotatable at a predetermined angular velocity for moving the tapes 901 and 902 along their lengthwise direction at the predetermined speed. The change in tensioning force along length of the fabric tape 900 also changes the tensioning force traverse to the length of the fabric tapes 901 and 902. In other words, by increasing the tangential distance between the rollers 201 to 203, more specifically the curved surfaces 206A and B, and the tensioning device 204 and 205, the tensioning force along and traverse the length of the fabric tape 900 will be increased simultaneously. A wall 207 is provided between the curved surfaces 206A and 206B to separate and to guide movement of said hook and eye tapes 901 and 902.

[0030] The curved surfaces 206A and 206B have plurality of apertures 208. These apertures 208 permit passage of heated gas from within the rollers 201, 202 and 203 to said hook and eye tapes 901 and 902. The heated gas is the preferred medium for heating the curved surfaces 206A and 206B as well as said hook and eye tapes 901 and 902 to an elevated temperature. In a different embodiment, the curved surfaces 206A and 206B may be made up of hot plates heated electrically to an elevated temperature as opposed to having heated medium emitting from within. In the preferred embodiment, the heated medium is dry gas heated to 100 degree Celsius. Other alternatives such as steam may be used instead of heated gas. The ironing effect is brought about by the combination of the heating and stretching effect exerted by the rollers 201, 202, 203 and the tensioning devices 204 and 205. In the preferred embodiment, periphery of the tensioning devices 204 and 205 has one or more grooves 204A and 205A for accommodating the hooks on the hook tape 901 when it runs over the periphery.

[0031] Referring to Figures 5A, 5B, 5B-1 and 5C, the second part 300 of the apparatus 100 includes four tensioning devices 301 to 304 cooperable with rollers 306, 307, 308, 309 and 310 respectively to exert a variable tensioning force along length of said fabric tapes 901 and 902. The tensioning devices 301 to 304 each includes a magnetic powder clutch 301A to 304A connecting a driver or motor to the rollers 306 to 310. The clutch 304A is connected to two rollers 309 and 310. These clutches 301A to 304A transmit the driving force from respective separate drivers or motors to the rollers 306 to 310. The output of the drivers or motors can be varied to bring about rotation of the rollers 306 to 310 at variable torque; hence movement of said fabric tape 900 can be at variable speed. As each tensioning device 301 to 304 has its own driver or motor, the rollers 306 to 309 and 310 can be rotated at different torques and to bring about movement of said fabric tape 900 along its length on roller surfaces at different speeds. This allows fine adjustment of the tensioning force exertable on said fabric tape 900 for optimum stretching. In another embodiment, the rollers 309 and 310 may be connected to individual tensioning device such that they can be rotated at different torques.

[0032] As shown in Figures 1, 2 and 5A, the rollers 306A and 306B to 310A and 310B are in pairs. One of them being connected to the driver or motor by the clutch and the other is a passive roller rotatably connected to the frame 101. These pairs of rollers define a boustrophedonic path for movement of said fabric tapes 901 and 902.

[0033] In the preferred embodiment, the second part 300 of the apparatus 100 is adapted to process the hook and eye tapes 901 and 902 simultaneously. As shown in Figure 1, the tapes 901 and 902 run over the rollers 306A to 310B side by side. Preferably the periphery of the roller has one or more grooves 312 for accommodating the hooks and eyes on the tapes 901 and 902 as the tapes 901 and 902 run over them.

[0034] In between the rollers 306A to 310B, there are drying means 311. The drying means 311 sticks out from and

are fixedly connected to the frame 301 with apertures for passing out heated gas. The heated gas blows onto the fabric tapes 901 and 902 that run around the drying means 311 for drying. Preferably, the drying means are tubes with apertures on their periphery emitting dry heated gas at 100 degree Celsius. The heated gas is ejected in a direction traverse the length of said fabric tape 901 and 902 to allow maximum contact between the heated gas and said tapes 901 and 902.

[0035] As shown in Figures 6A to 6C, the third part 400 of the apparatus 100 includes at least three pairs of rollers 401, 402 and 403 collectively guiding the movement of the fabric tape 900 along its length. The first and second pairs of rollers 401 and 402 are placed next to any opposite each other or in a different embodiment, arranged side-by-side. The third part 400 has a two-part monitoring device 404. The first part 404A of the monitoring devices 404 produces a signal indicative of the length of said fabric tapes 901 and 902 that pass the part 404A within a given period of time. The first part 404A is provided on the shaft 410 common to the first pair of rollers 401 and is preferably a high speed rotational encoder that converts the angular position or motion of the shaft to an analog or digital code. The output code is decoded to produce pulse equivalents. Length of the tapes 901 and 902 that run past the encoder 404A is calculated by the following formula:

$$\text{Pulse equivalents} \times \text{pulse measurement} = \text{length.}$$

[0036] The second part 404B is provided below the first part 404A of the monitoring device 404. The second part of the monitoring device 404B is a pair of sensors, preferably metal detectors, that produces a readable signal indicative of number of rows of hooks and eyes fastener that passes it within the same given period of time and/or on the same length of said fabric tapes 901 and 902 that passes the first part of the monitoring device 404A. One of the sensors 404B is provided for counting the number of rows of hook fasteners on the hook tape 901 and the other sensor 404B is provided for counting the number of rows of eye fasteners on the eye tape 902. The first and second parts 404A and 404B output the signal to the Programmable Logic Controller (PLC) for calibration. The PLC calculates spacing between each successive rows of hooks or eyes and compare the calculated spacing with a preferred or required spacing. If there is a difference between the calculated spacing and the required spacing, signal is sent to a driver which in turn signals the tensioning devices 204, 205 and 301 to 305 to vary the tensioning force exertable onto said hook and/or eye tapes 901 and 902, for example by changing rotational speed of the drivers of the tensioning devices 301 to 305 independently and/or moving the tensioning devices 204 and 205 towards or away from one another. Said hook and eye tapes 901 and 902 pass the third pair of rollers 403 and leave the third part 400 of the apparatus 100.

[0037] As shown in Figures 1, 6A and 7, the fourth part 500 of the apparatus 100 has two collectors 501 and 502 for collection of the hook and eye tapes 901 and 902 simultaneously. The collectors 501 and 502 are freely rotatable about respective shafts extending from the respective frames 103. These collectors 501 and 502 are rotatable in an anti-clockwise direction to collect said fabric tapes 901 and 902 after they have been processed. In a different embodiment, the collectors 501 and 502 are rotatable in a clockwise direction to collect the fabric tapes 901 and 902. No further tensioning is required or desired after said tapes 901 and 902 leave the second part 300 of the apparatus 100. The anti-clockwise movement of the collectors 501 and 502 is actuated by actuation force exerted by respective actuators 504 and 505, preferably weights. To avoid tensioning said tape 900 by the actuation force, the collectors 501 and 502 are subjectable to a counter force for moving them in a direction opposite that of the movement actuated by the actuator. That way, movement of the collector 501 and 502 anti-clockwise is only allowed when the actuation force is larger than the counter force. The counter force is created when the movement of said fabric tapes 901 and 902 out of the third part 400 of the apparatus 100 is slower than the collection of said tapes 901 and 902 by the respective collectors 501 and 502. The collectors 501 and 502 are connected to the weights 504 and 505 by respective threads 506 and 507. The weights 504 and 505 are allowed to hang freely at one end of the threads 506 and 507. The threads 506 and 507 run over respective pulleys 508 and 509 which assist movement of the threads 506 and 507 along its length.

[0038] When the counter force exerted by the weight 504 is the same as the actuation force, the collectors 501 and 502 will not rotate. When the actuation force is greater than the counter force, the collectors 501 and 502 rotate in the anti-clockwise direction to collect said tape 900. The weight 504 can be adjusted basing on the speed at which said fabric tape 900 moves out of the third part 400 of the apparatus 100.

[0039] In a different embodiment, the collectors 501 and 502 are rotatably attached to a common frame 510 which is an extension of the frame 101.

[0040] The invention has been given by way of example only, and various other modifications of and/or alterations to the described embodiment may be made by persons skilled in the art without departing from the scope of the invention as specified in the appended claims.

Claims

1. An apparatus for processing a tape with a plurality rows of hooks or a plurality rows of eyes along a path comprising:

5 a body having
a roller along the path, the roller being rotatable relative to the body for moving a said tape along its lengthwise direction;
a tensioning device along the path, the tensioning device being cooperable with the roller to exert a tensioning force along length of said tape; and
10 a monitoring device along the path to determine spacing between successive rows of hooks or eyes.

2. The apparatus as claimed in claim 1, wherein the monitoring device is adapted to output determined spacing between successive rows of hooks or eyes in a readable form to a processor for calibration.

15 3. The apparatus as claimed in claim 2, wherein the tensioning device is moveable relative to the curved surface for changing tangential distance between the tensioning device and the curved surface and hence change the tensioning force exertable along length of said tape.

20 4. The apparatus as claimed in claim 3, wherein the processor is adapted to output a signal after calibration in response to which the tensioning device is adapted to move relative to the curved surface for changing the tangential distance.

5. The apparatus as claimed in claim 2, wherein the tensioning device is cooperable with the roller to exert a variable tensioning force along length of said tape, and wherein the tensioning device and/or the roller is/are rotatable at a variable torque to bring about movement of said tape at a variable speed along its length.

25 6. The apparatus as claimed in claim 5, wherein the processor is adapted to output a signal after calibration to bring about a change in the variable torque basing on result of the calibration.

30 7. The apparatus as claimed in any one of claims 1 to 6, wherein the monitoring device comprises first and second parts for taking first and second measurements and outputting the measurements to the processor for calculation and calibration.

35 8. The apparatus as claimed in claim 7, wherein the first measurement comprises information about length of at least part of said tape passing by within a given period of time and the second measurement comprises information about number of rows of hooks or eyes in the length within that same period of time.

9. An apparatus for processing a fabric tape comprising:

40 a body having
a roller being rotatable relative to the body for moving a said tape along its lengthwise direction; and
a tensioning device which is cooperable with the roller to exert a tensioning force along length of said tape; and means for heating at least part of the roller to an elevated temperature for heating said tape engaged with the roller.

45 10. The apparatus as claimed in claim 9, wherein the roller has a surface for engaging said tape and being heatable to the elevated temperature for heating said tape engaged with the surface.

11. The apparatus as claimed in claim 10, wherein the surface has a plurality of apertures through which the heating means passes.

50 12. The apparatus as claimed in claim 11, wherein the heating means comprises a heated medium.

13. The apparatus as claimed in claim 12, wherein the heated medium comprises heated gas.

55 14. The apparatus as claimed in any one of claims 9 to 13 further comprising means for drying said tape.

15. The apparatus as claimed in claim 14, wherein the drying means projects from the body and has a plurality of apertures.

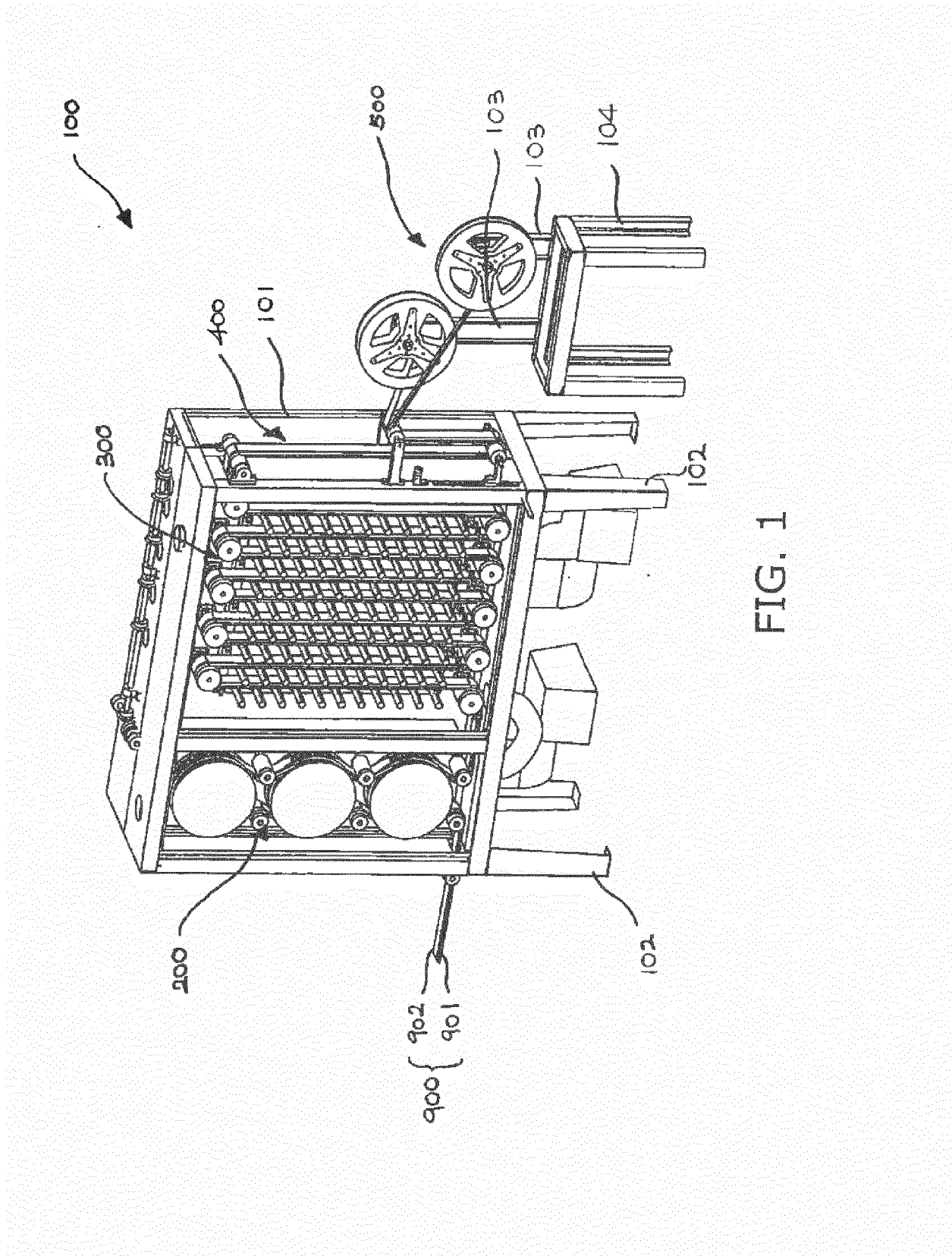


FIG. 1

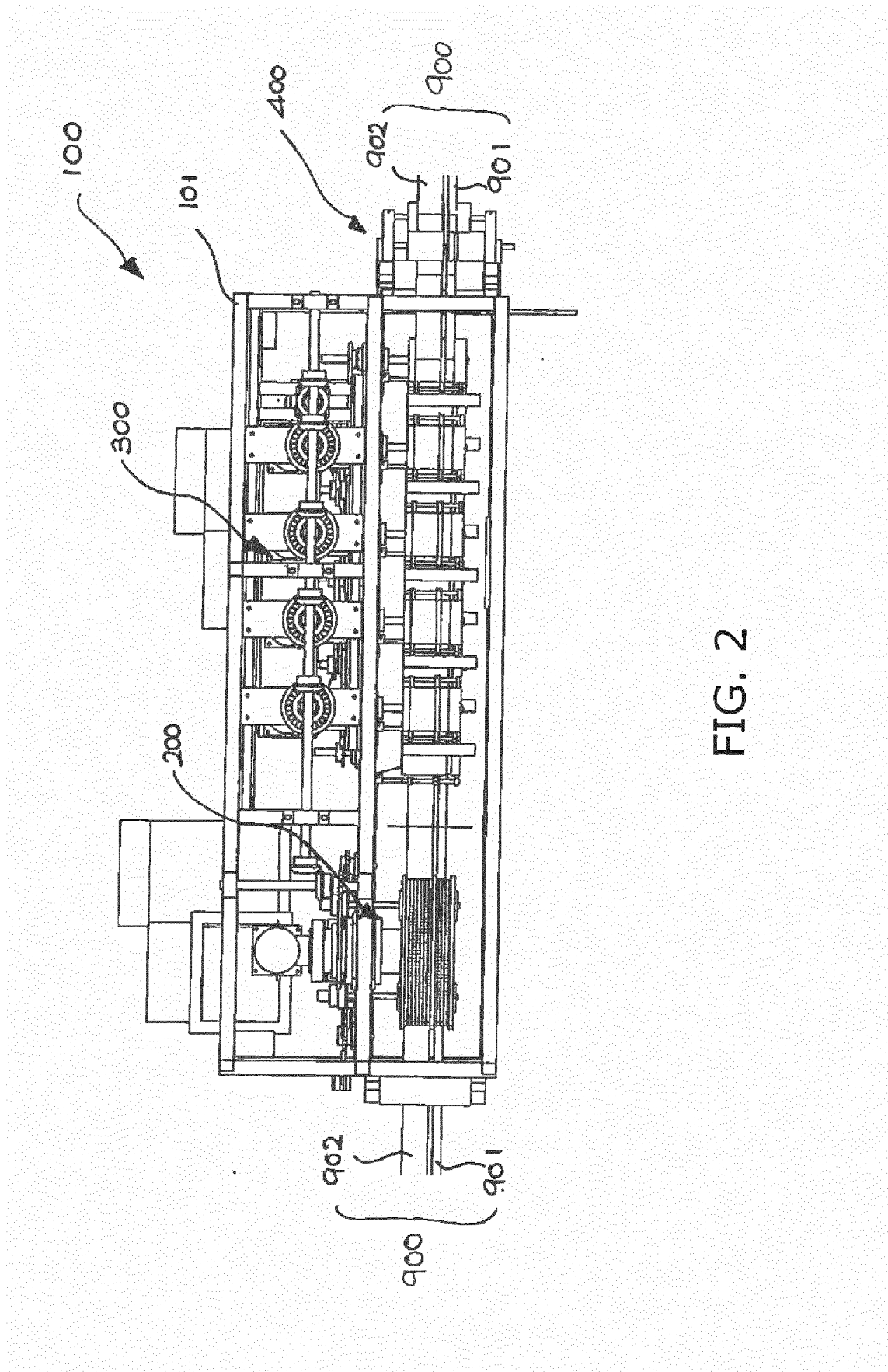


FIG. 2

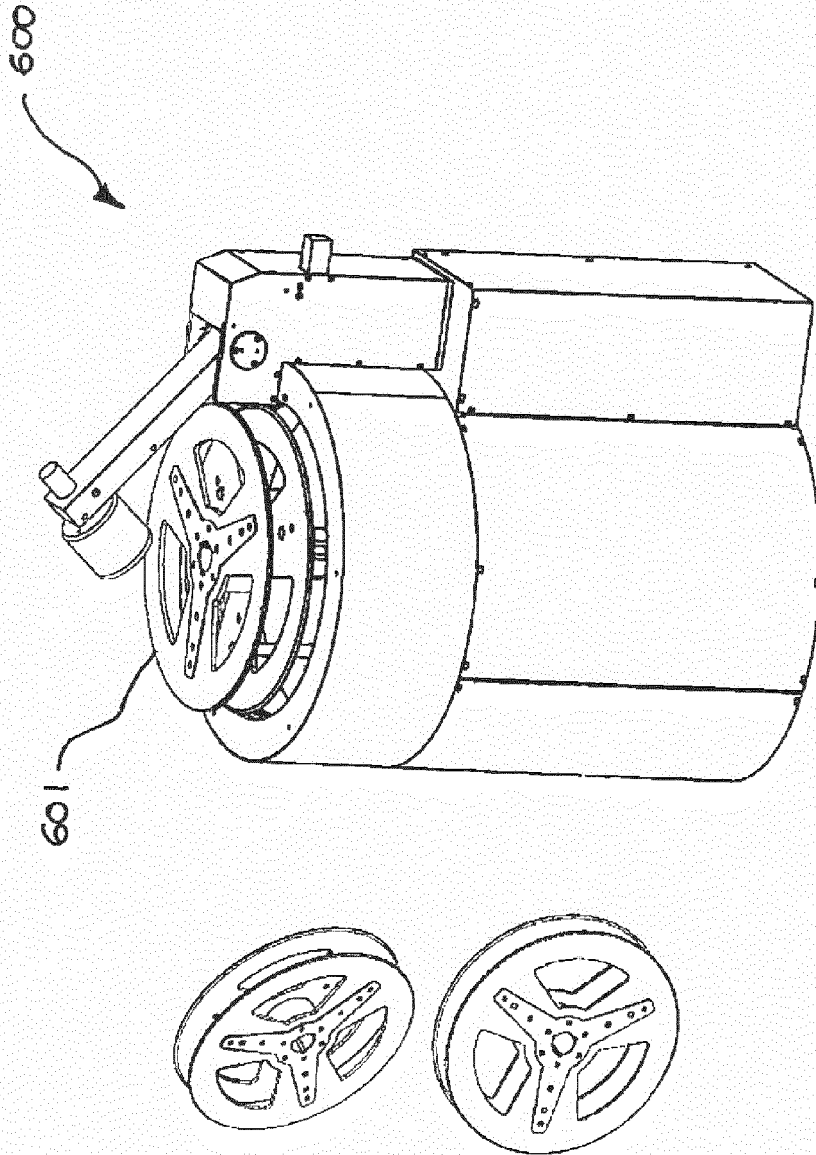


FIG. 3

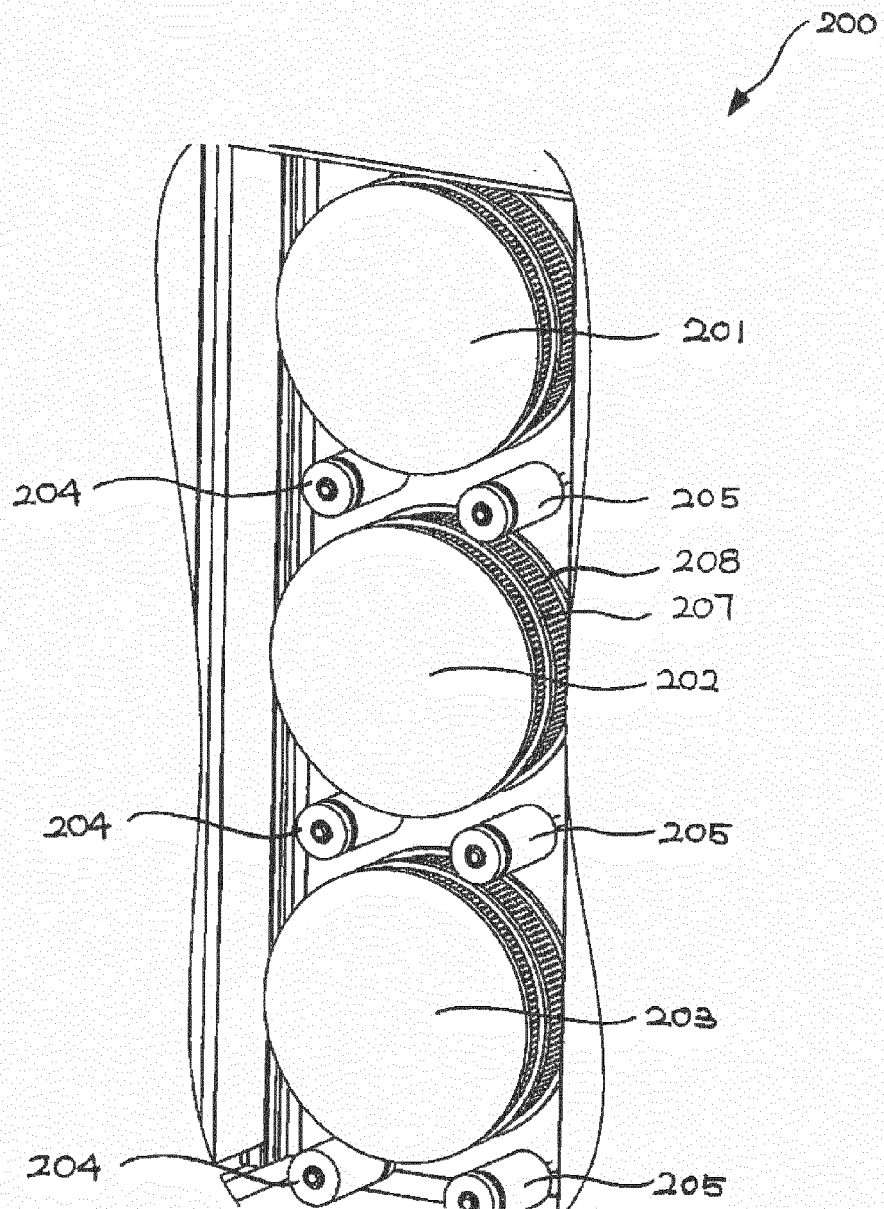


FIG. 4A

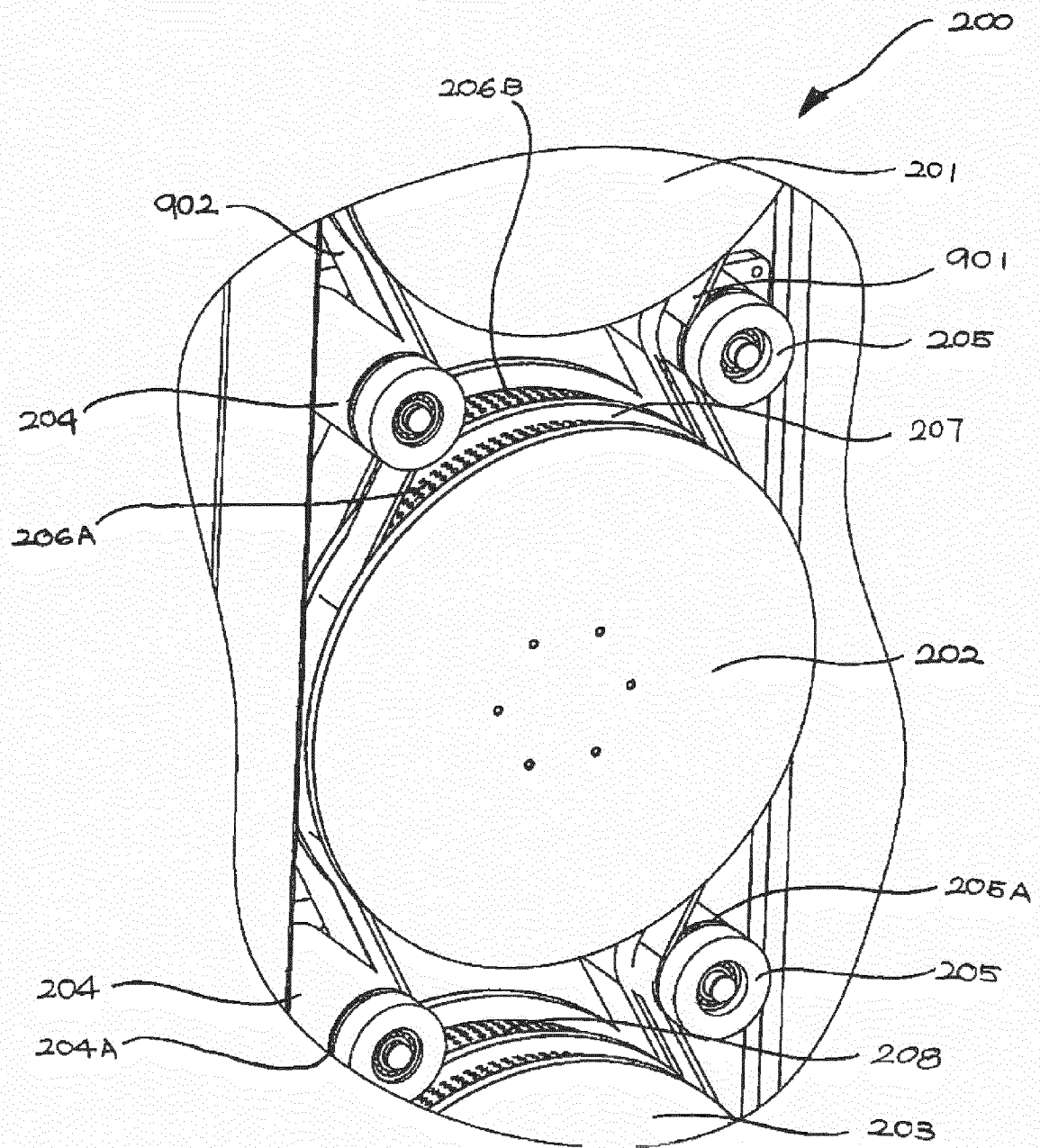


FIG. 4B

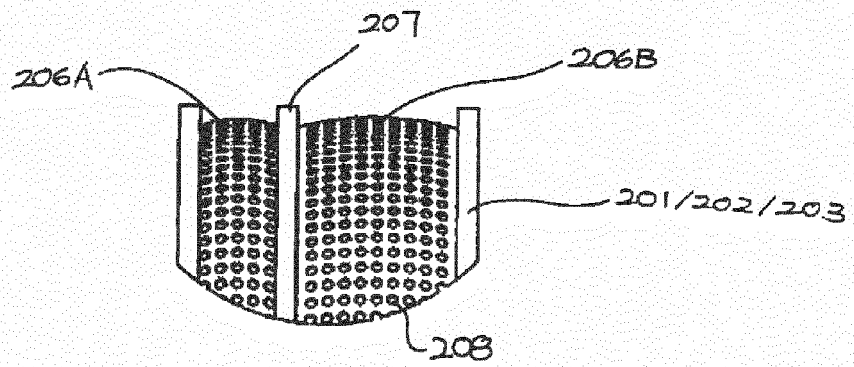


FIG. 4C

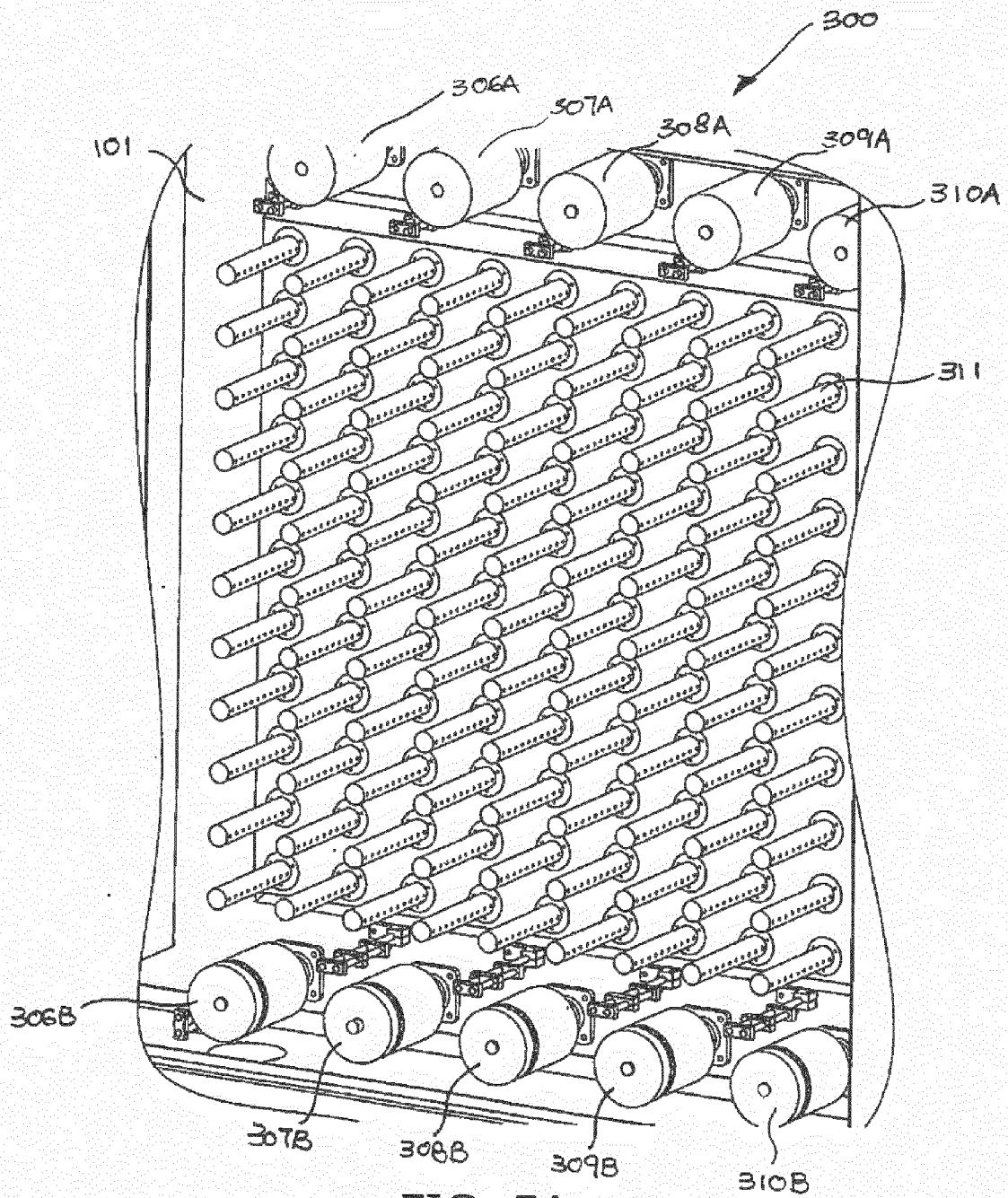


FIG. 5A

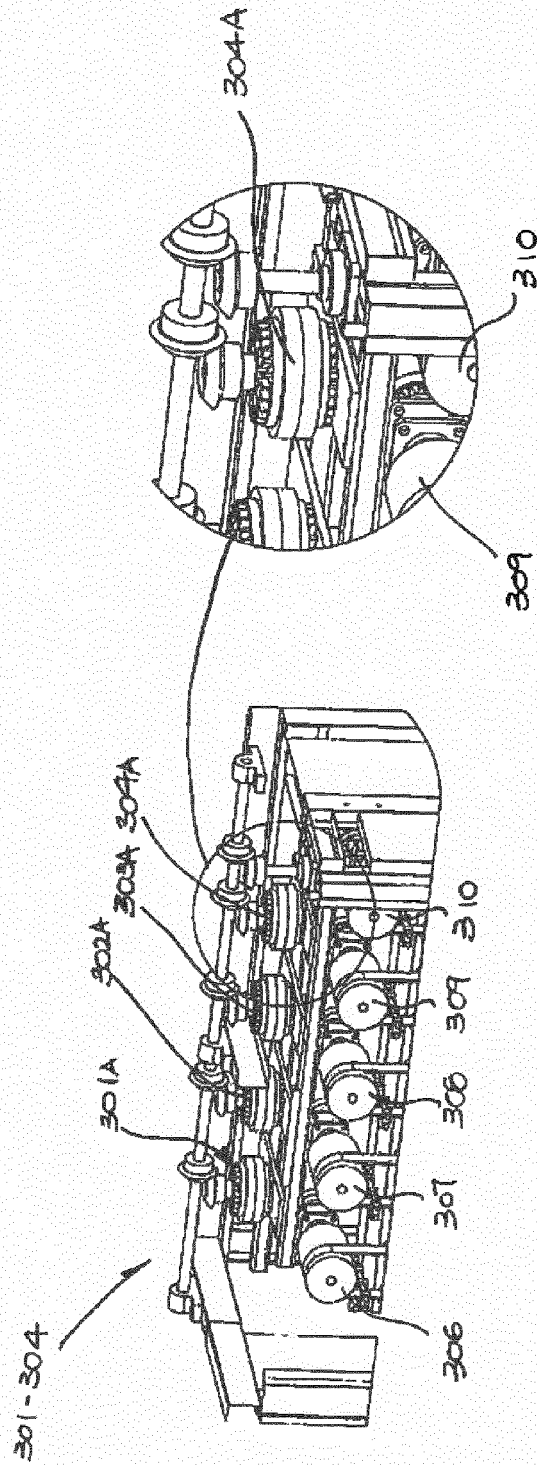


FIG. 5B

FIG. 5B-1

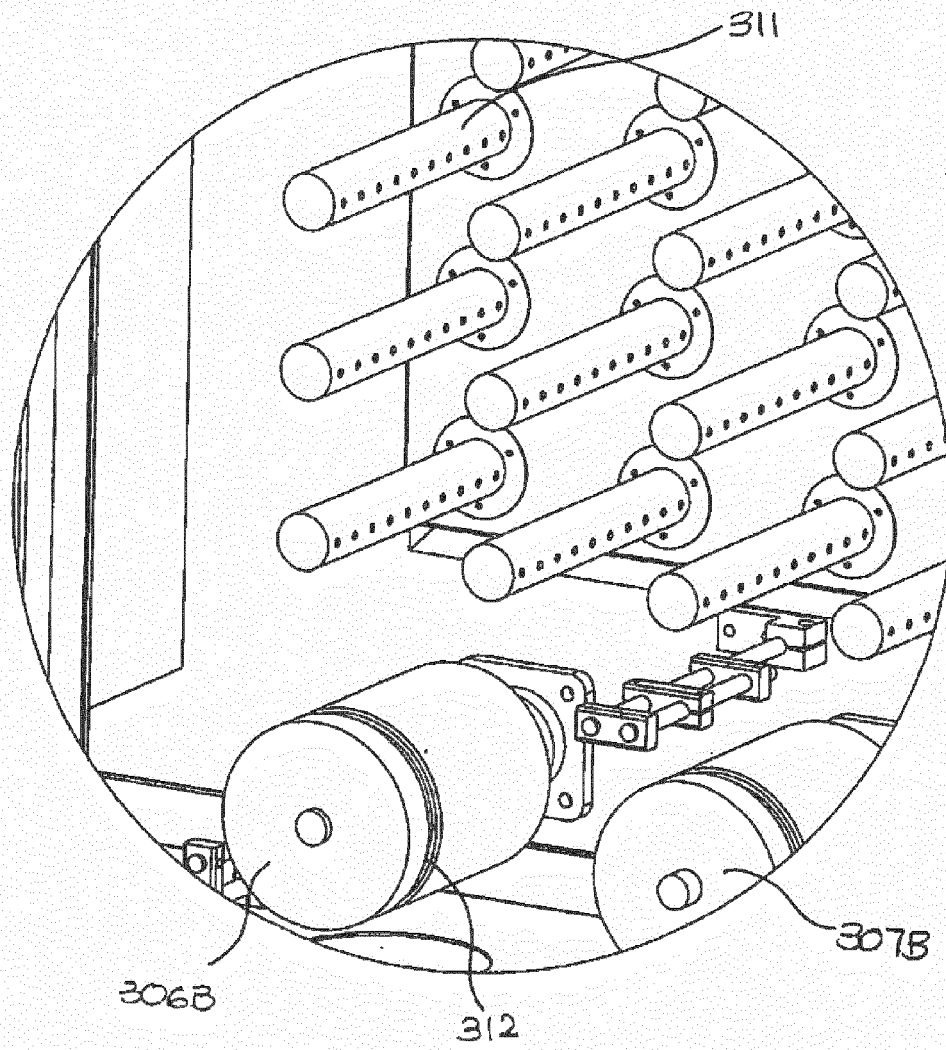


FIG. 5C

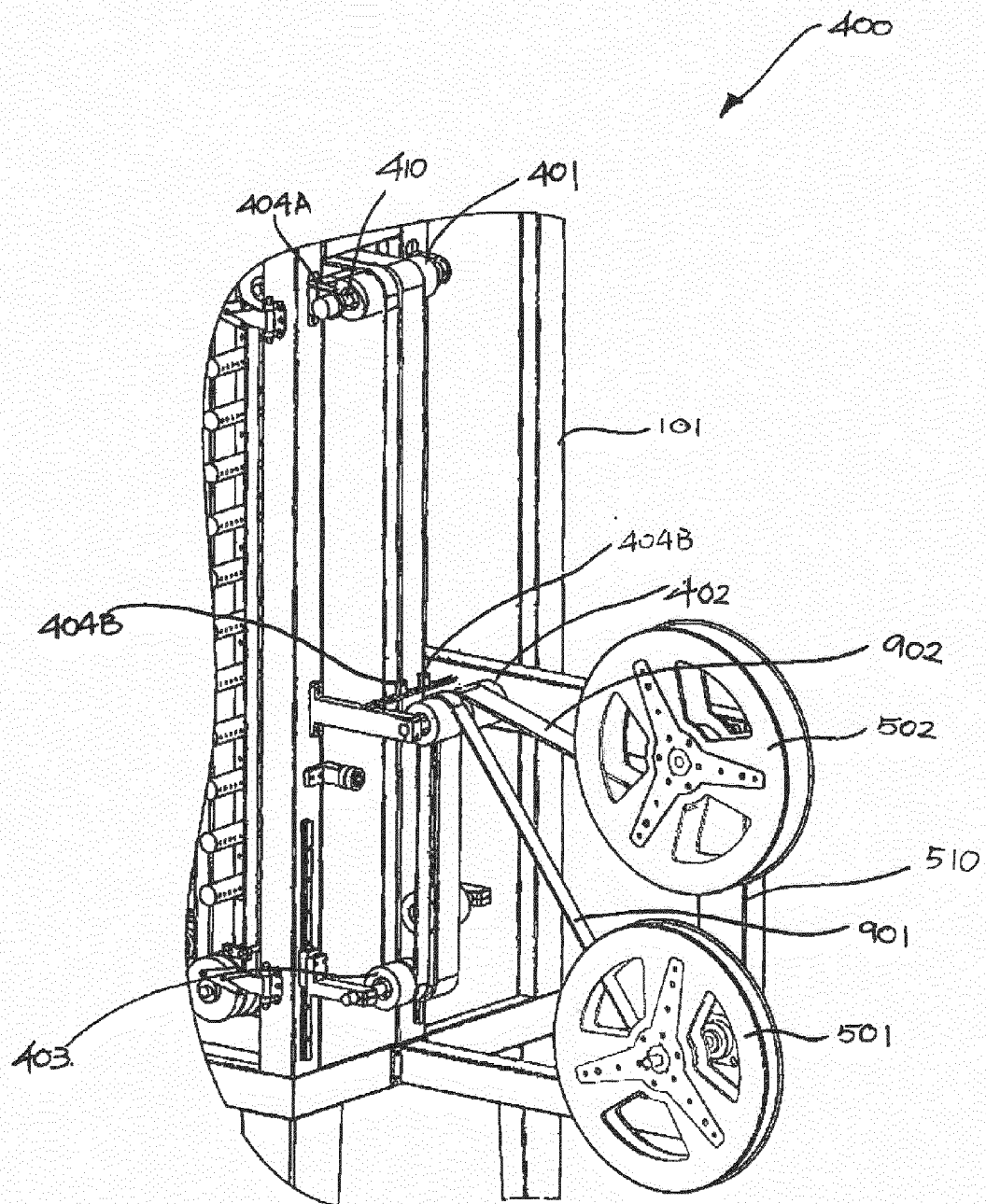


FIG. 6A

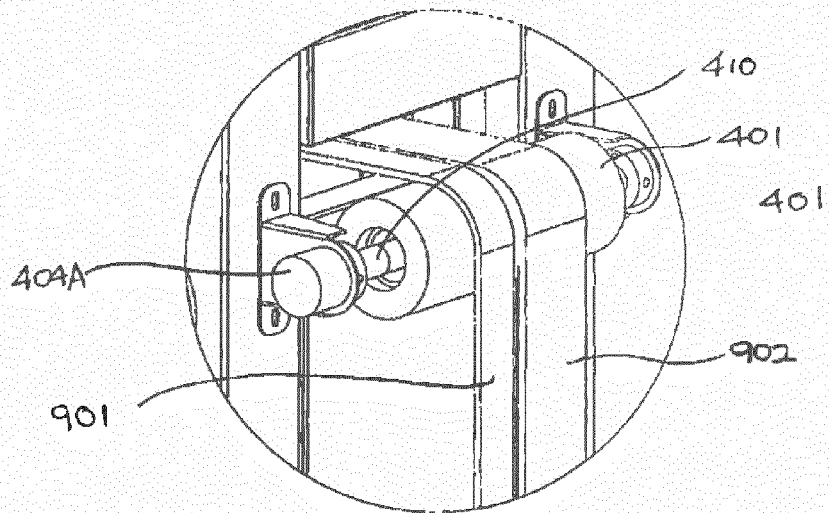


FIG. 6B

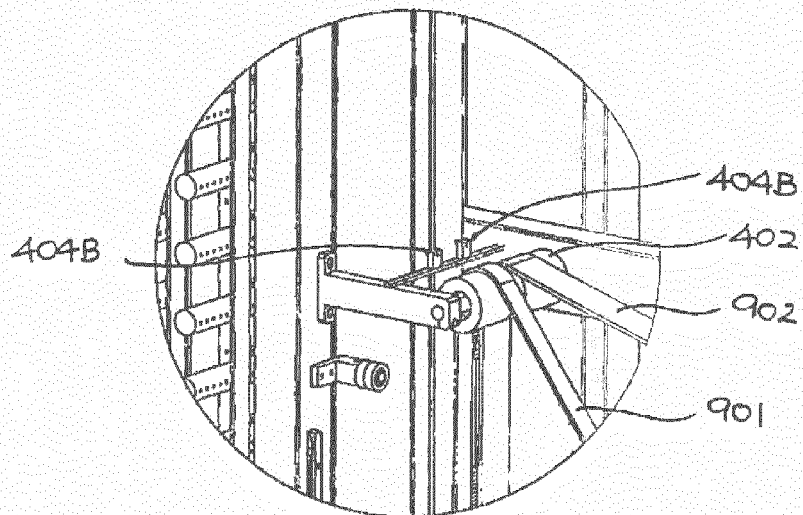


FIG. 6C

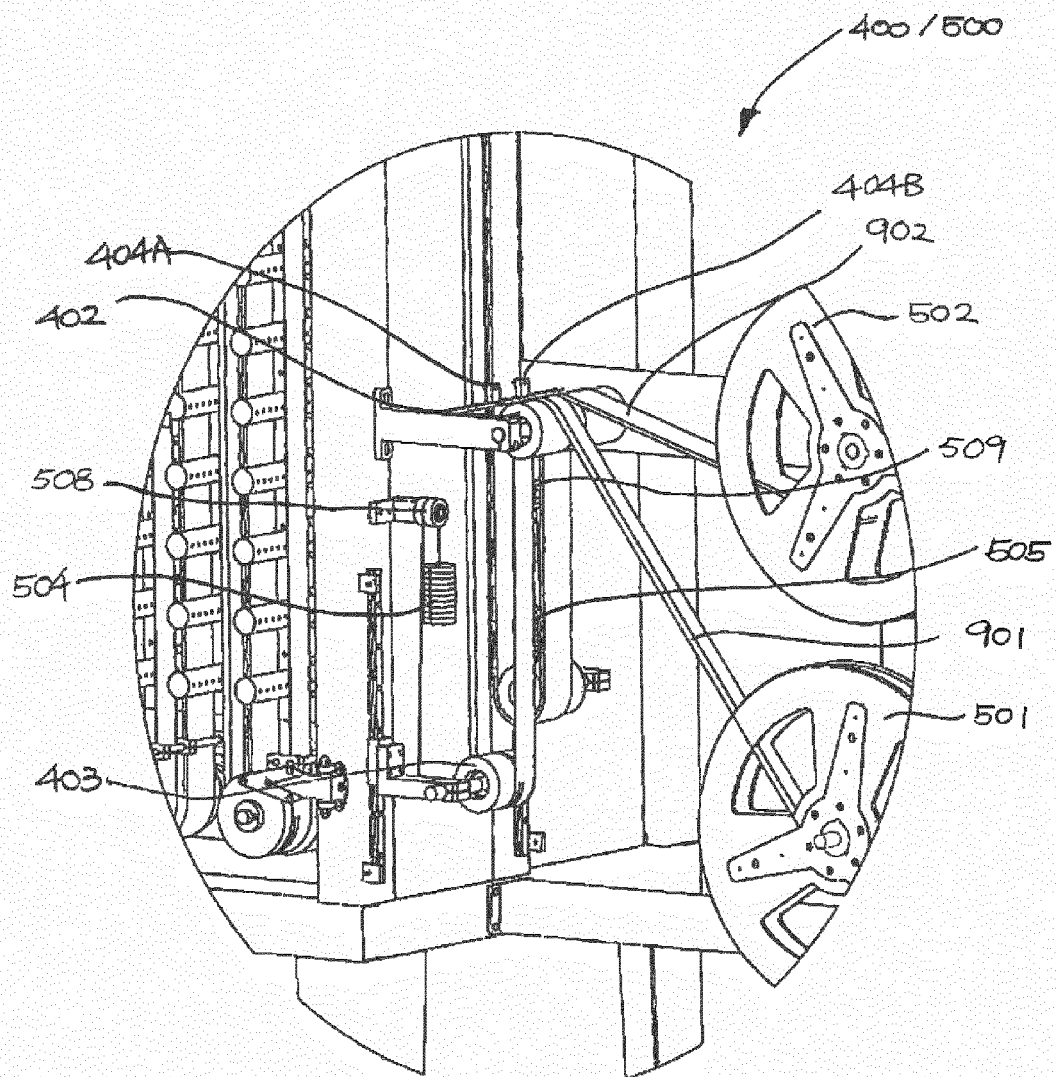


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 12 17 2990

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	US 3 589 030 A (TROOPE WALTER S ET AL) 29 June 1971 (1971-06-29) * column 1, lines 1-19 * * column 2, lines 17-58 * * figures 1-3 *	1-15	INV. B65H23/025 B65H23/188 B65H23/16 D06B3/12
A	US 2007/056122 A1 (SHALEV ITZHAK [IL] ET AL) 15 March 2007 (2007-03-15) * paragraphs [0001], [0036], [0037], [0040], [0044] - [0046] * * figure 1 *	1	
A	DE 198 60 424 C1 (MAGEBA TEXTILMASCHINEN GMBH & [DE]) 16 March 2000 (2000-03-16) * column 1, lines 1-7,58-68 * * column 2, lines 1-24 * * figures 1,3 *	1	
A	GB 2 013 306 A (YOSHIDA KOGYO KK) 8 August 1979 (1979-08-08) * page 1, lines 10-22,64-87,122-127 * * page 2, lines 112-128 * * page 3, lines 55-65 * * figures 1,2 *	9-15	TECHNICAL FIELDS SEARCHED (IPC) B65H A44B D06B F26B
A	DE 20 24 315 A1 (.) 9 December 1971 (1971-12-09) * page 2, paragraph 2 * * page 4, paragraphs 1,2 * * figures 1,2 *	9	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 May 2013	Examiner Cescutti, Gabriel
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	

 2
EPO FORM 1503 03/82 (P04C01)



Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 12 17 2990

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-8

Claims 1-8 are directed to an apparatus for processing a tape with a plurality rows of hooks or a plurality rows of eyes along a path and keeping a constant longitudinal spacing between the hook and eyes elements.

2. claims: 9-15

Claims 9-15 are directed to an apparatus for processing a fabric tape providing with a single guiding unit an ironing effect.

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

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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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