



(51) International Patent Classification:

A21D 6/00 (2006.01) A47J 43/20 (2006.01)
A21D 13/00 (2006.01)

(21) International Application Number:

PCT/IB2015/058531

(22) International Filing Date:

4 November 2015 (04.11.2015)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

MX/a/2014/016071

19 December 2014 (19.12.2014)

MX

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
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SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,
TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,

[Continued on next page]

(54) Title: ROLLER SYSTEM FOR LAMINATED PRODUCTS

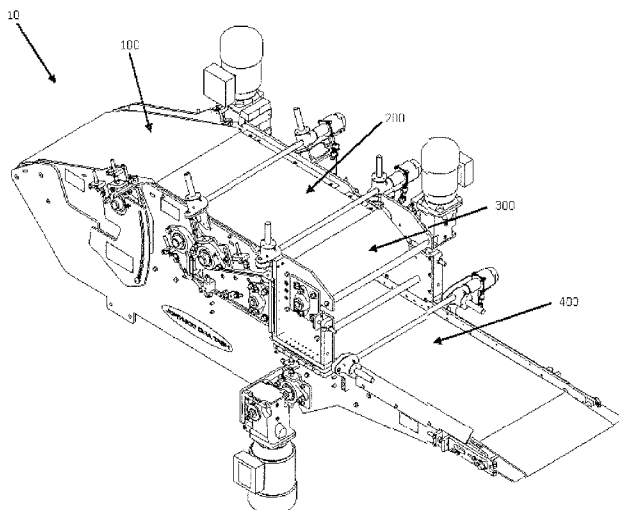


Fig. 1

(57) Abstract: A roller system laminates products in dif-
ferent shapes of any type of mass and/or combination
thereof, for obtaining different rolled tri-dimensional
shapes, to be later baked and/or fried. A roller system com-
prises a horizontal conveyor belt, set on the upper part of a
main support structure, which receives laminated products
and conveys them in a first direction at a first velocity to-
wards a start roller belt; said start roller belt which is per-
pendicular to the horizontal conveyor belt, is set over a
second mobile support structure, to begin the rolling of the
laminated products at a second velocity and in a second
direction, said start roller belt transports the laminated
products with the rolling having started towards a rolling
belt; the rolling belt on an inclined plane under the hori-
zontal conveyor belt.



LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, **Published:**
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, — *with international search report (Art. 21(3))*
GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

ROLLER SYSTEM FOR LAMINATED PRODUCTS

Object of the Invention

The present invention refers to a roller system for laminated products which present
5 different shapes of any type of mass and/or a combination of them, with the end goal of
obtaining different rolled tri-dimensional shapes, to be baked and/or later fried.

Background

The rolling methods which exist in the industry, only allow rolling the laminated shape,
10 without having the possibility of obtaining an open rolling or of being able to control the rolling
degree of the laminated shape, so that this always remains closed and cannot generate
different shapes with the same feeding directions and laminated shape. These types of
methods are very limited in so far as the laminated shapes which can be developed, given that
the rolling is carried out through belt sections placed in a vertical manner, and which rest over
15 a horizontal belt which is what actually feeds the laminated shapes towards the oven.

The present invention is different from those which already exist in the state of the art
given its flexibility to carry out the rolling of laminated products in different directions, but
mainly in the ability to control that which is closed or open or the rolling of the laminate product
to be fed, as well as freeing the rolling at a desired point to allow achieving different rolled
20 shapes with the same laminated figure to be rolled.

Brief Description of the Invention

Present invention refers to a roller system for laminated products comprising a
horizontal conveyor belt, set on the upper part of a main support structure, which receives
25 laminated products and conveys them in a first direction at a first velocity towards a start roller

belt; said start roller belt which is perpendicular to the horizontal conveyor belt, is set over a second mobile support structure, to begin the rolling of the laminated products at a second velocity and in a second direction, said start roller belt transports the laminated products with the rolling having started towards a rolling belt; the rolling belt on an inclined plane under the
5 horizontal conveyor belt, set on a third mobile support structure, where the rolling of laminated products is undertaken and then conveys them towards an unloading belt at a third velocity and in a third direction; said horizontal unloading belt, set on the lower part of the main support structure unloads the rolled products.

10 Brief Description of Figures

The illustrative embodiment may be described referencing the accompanying figures, which refer to:

Figure 1 shows an isometric view of the roller system for laminated products of present invention.

15 Figure 2 shows a longitudinal cut of the roller system for laminated products of present invention.

Figure 3 shows detail of the guiding rails for the start roller belt and for the roller belt of the roller system for laminated products of present invention.

Figure 4 shows the transference of laminated products from the conveyor belt towards
20 the start roller belt.

Figure 5 shows the rolling of the laminated products undertaken from the start roller belt and the roller belt.

Figure 6 displays the unloading of the rolled products from the roller belt towards the unloading belt.

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DETAILED DESCRIPTION OF THE INVENTION

The following description is made referencing figures 1 through 6 indistinctively.

The present invention refers to a roller system (10) for laminated products (1) based on any type of mass and/or combination thereof. Said roller system (10) is found set over a main
5 support structure (20).

The roller system (10) presents a feeding belt (100), which itself presents an entrance end (101) and an exit end (102), said feeding belt (100) is found partially mounted unto a first mobile support structure (110), the feeding belt (100) presents a tilting movement at the exit end (102), in such a way that the first support structure presents a pivot (111) near the
10 entrance end (101) of the feeding belt (100), in such a way that the first support structure (110) moves in accordance to the main support structure (20), said feeding belt (100) presents a plurality of tracking rollers (103), one tension roller (104) and one driver roller (105), the tensing roller (104) and the driver roller (105) are found set on the first support structure (110), while the tracking rollers (103) are distributed between the first support structure (110) and the
15 main support structure (20); said tension roller (104) is displaced vertically within a groove (113) set unto a lateral wall (112) of the first support structure (110).

The exit end (102) of the feeding belt (100) is found in communication with an entrance end (201) of a conveyor belt (200) preferably mounted on a horizontal plane on the upper end of the main support structure (20), said conveyor belt (200) presents an exit end (2020)
20 opposite to the entrance end (201), a plurality of tracking rollers (203), a tension roller (203) and one driver roller (205), the tension roller (204) is displaced angularly to be able to tense the conveyor belt (200) and ensure its proper functioning in this way, said displacement is carried out preferably by means of a first servomotor.

The exit end (202) of the conveyor belt (100) is found in communication with the
25 working surface (303) of a start roller belt (300) set on a vertical plane, in such a way that it is found perpendicular to the conveyor belt (200), said start roller belt (300) comprises a driver

roller (301) and at least two tracking rollers (302); said start roller belt (300) has the ability to displace itself at a velocity and/or in a direction different from those of the conveyor belt (200), the above in order to achieve different types of rolling on the laminated products (1), said start roller belt (300) is found mounted on a second mobile support structure (330), said second mobile support structure (330) is found supported on a longitudinal guide rail (340) set over the main support structure (20) to longitudinally move the start roller belt (300) in relation to the conveyor belt (200), in such a way that said start roller belt is able to approach/distance itself from the conveyor belt (200), this adjustment allows achieving the desired aperture on the rolling product (2), this adjustment is crucial to achieve the rolling of the product, and it is undertaken, preferably by means of a second servomotor.

A rolling belt (400) set on an inclined plane which presents an entrance end (401) and an exit end (402), the roller belt (400) comprises a plurality of tracking rollers (403), a tension – driver roller (404); the entrance end (401) is found at a higher point in relation to the exit end (402), similarly, said entrance end (401) is found below the exit end (102) of the conveyor belt (200) and in close proximity to the working surface (301) of the start roller belt (300); said roller belt (400) is found mounted over a third mobile support structure (430) which is found mounted over a vertical guide rail (431), said vertical rail guide (431) is found mounted over the second mobile support structure (330), in such a way that said roller belt (400) moves vertically in relation to the start roller belt (300), this adjustment allows approaching or distancing the roller belt to the return of the discharging belt (500). This adjustment allows ensuring and maintaining the desired aperture on the rolling product (2) and is carried out preferably by means of a third servomotor.

Given that the third and second mobile support structures (430, 330) are found connected, upon approaching/distancing the start roller belt (300) of the conveyor belt (200), consequently the roller belt (400) also approaches/distances itself longitudinally from/to second mobile support structure (330) of said conveyor belt (200), so that said roller belt (400) has two movements, a vertical movement and a longitudinal movement.

An unloading belt (500) which receives the laminated product (1) once it has been rolled from the rolling belt (400), which additionally feeds the rolled product (2) to the next step of the process, whether it is to be baked or fried. Said belt comprises an entrance end (501), an exit end (502), a plurality of tracking rollers (503) and a tensing-driving roller (505), said
5 unloading belt is found mounted on the main support structure (20).

Alterations to the structure described in the present would be able to be foreseen by those persons skilled in the art. However, it must be understood that the present description is related with the preferred embodiments of the invention, which is merely for illustrative purposes only, and must not be understood as a limitation of the invention. All obvious
10 embodiments within the spirit of the invention, such as changes to the shape, material and sizes of the elements which make up the invention, must be considered as lying within the scope of the attached claims.

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CLAIMS

Having sufficiently described my invention, I consider it as novel and thus claim as my exclusive property, everything contained within the following claims:

- 5 1. A roller system for laminated products comprising a horizontal conveyor belt, set on the upper part of a main support structure, which receives laminated products and conveys them in a first direction at a first velocity towards a start roller belt; said start roller belt which is perpendicular to the horizontal conveyor belt, is set over a second mobile support structure, to begin the rolling of the laminated products at a
10 second velocity and in a second direction, said start roller belt transports the laminated products with the rolling having started towards a rolling belt; the rolling belt on an inclined plane under the horizontal conveyor belt, set on a third mobile support structure, where the rolling of laminated products is undertaken and then conveys them towards an unloading belt at a third velocity and in a third direction;
15 said horizontal unloading belt, set on the lower part of the main support structure unloads the rolled products.
2. The roller system for laminated products according to claim 1, wherein prior to the conveyor belt a feeding belt is found set to receive laminated products and operable for transporting said pieces towards the conveyor belt.
- 20 3. The roller system for laminated products according to claim 2, wherein the feeding belt presents an entrance end, an exit end, a plurality of tracking rollers, a tension roller and a driver roller.
4. The roller system for laminated products according to claim 3, wherein the tension roller and the driver roller are found set on a first mobile support structure, while the
25 tracking rollers are distributed between the first support structure and the main support structure.

5. The roller system for laminated products according to claim 4, wherein said tension roller is vertically displaced in a groove set on a lateral wall of the first mobile support structure.
6. The roller system for laminated products according to claim 2, wherein the main mobile support structure presents a pivot near the entrance end of the feeding belt, in such a way that the first support structure presents a tilting movement in accordance to the main support structure.
7. The roller system for laminated products according to claim 1, wherein said conveyor belt presents an exit end opposite to an entrance end, a plurality of tracking rollers, one tension roller and one driver roller.
8. The roller system for laminated products according to claim 7, wherein the tensing roller is angularly displaced to tense the conveyor belt.
9. The roller system for laminated products according to claim 8, wherein said displacement is carried out by means of a first servomotor.
10. The roller system for laminated products according to claim 1, wherein said start roller belt comprises a driver roller and at least two tracking rollers.
11. The roller system for laminated products according to claim 10, wherein the second mobile support structure is found supported on a longitudinal guide rail set over the main support structure to longitudinally move the start roller belt in relation to the conveyor belt, in such a way that said start roller belt approaches/distances itself from the conveyor belt.
12. The roller system for laminated products according to claim 11, wherein the second velocity and the second direction of said start roller belt are different from the first velocity and first direction of the conveyor belt.
13. The roller system for laminated products according to claim 11, wherein the second velocity and the second direction of said start roller belt are equal to the first velocity and first direction of the conveyor belt.

14. The roller system for laminated products according to claim 11, wherein the second velocity of said start roller belt is different from the first velocity of the conveyor belt.
15. The roller system for laminated products according to claim 11, wherein the second direction of said start roller band is different from the first direction of the conveyor belt.
- 5 16. The roller system for laminated products according to claim 11, wherein the movement is undertaken by means of a second servomotor.
17. The roller system for laminated products according to claim 1, wherein the roller belt presents an entrance end, an exit end a plurality of tracking rollers, a tension roller and a driver roller.
- 10 18. The roller system for laminated products according to claim 17, wherein the entrance end is found at a higher point in relation to the exit end, similarly, said entrance end is found below the exit end of the conveyor belt and in close proximity to the working surface of the start roller belt.
- 15 19. The roller system for laminated products according to claim 18, wherein the third mobile support structure which is found mounted over a vertical guide rail, said vertical rail guide is found mounted over the second mobile support structure, in such a way that said roller belt moves vertically in relation to the start roller belt.
- 20 20. The roller system for laminated products according to claim 19, wherein the movement is undertaken by means of a third servomotor.
21. The roller system for laminated products according to claim 19, wherein the third mobile support structure is found connected to the second support structure, in such a way that said roller belt has two movements, a vertical movement and a longitudinal movement.
- 25 22. The roller system for laminated products according to claim 1, wherein said unloading belt comprises an exit end, an entrance end, a plurality of tracking rollers, a tension roller and a driver roller.

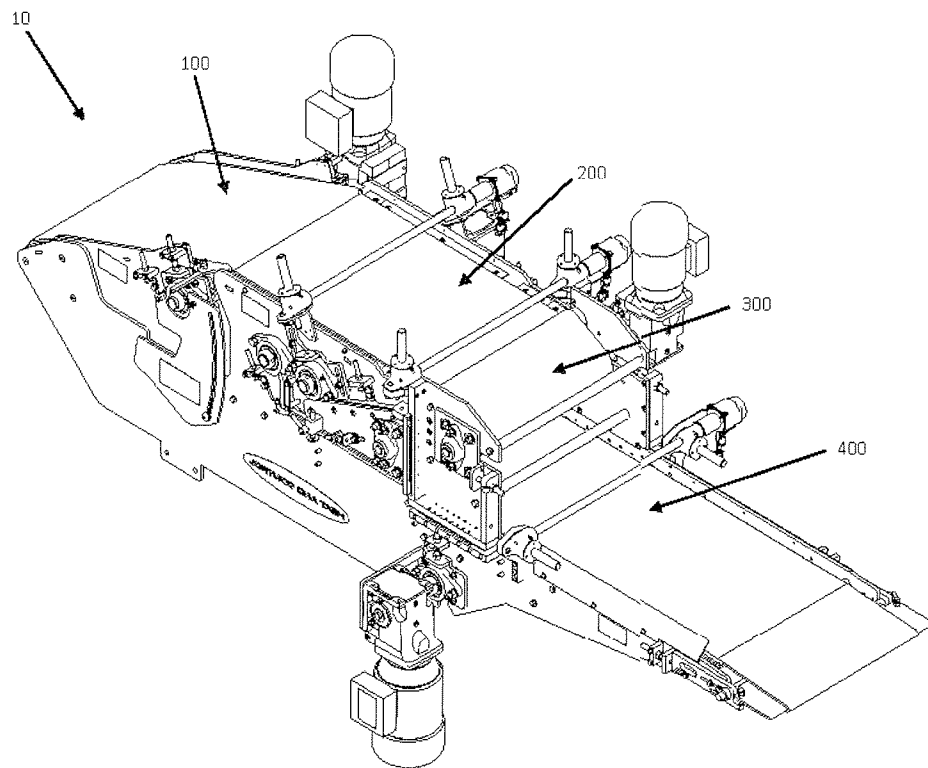


Fig. 1

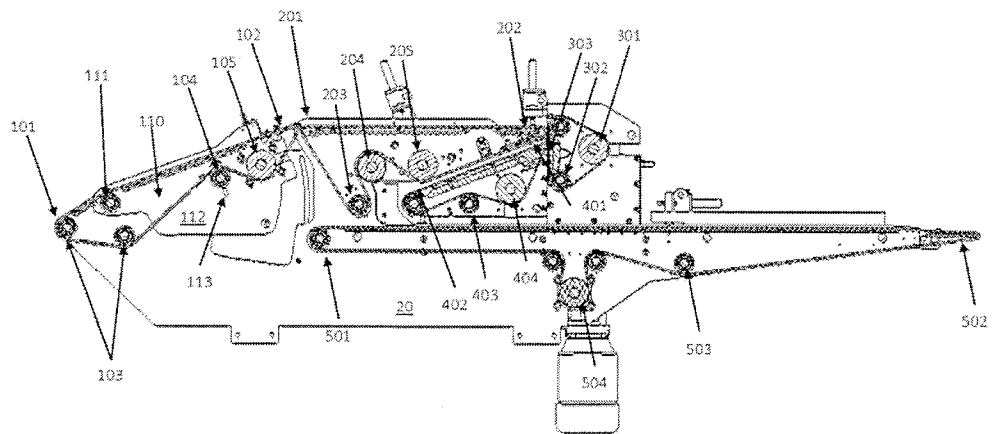


Fig. 2

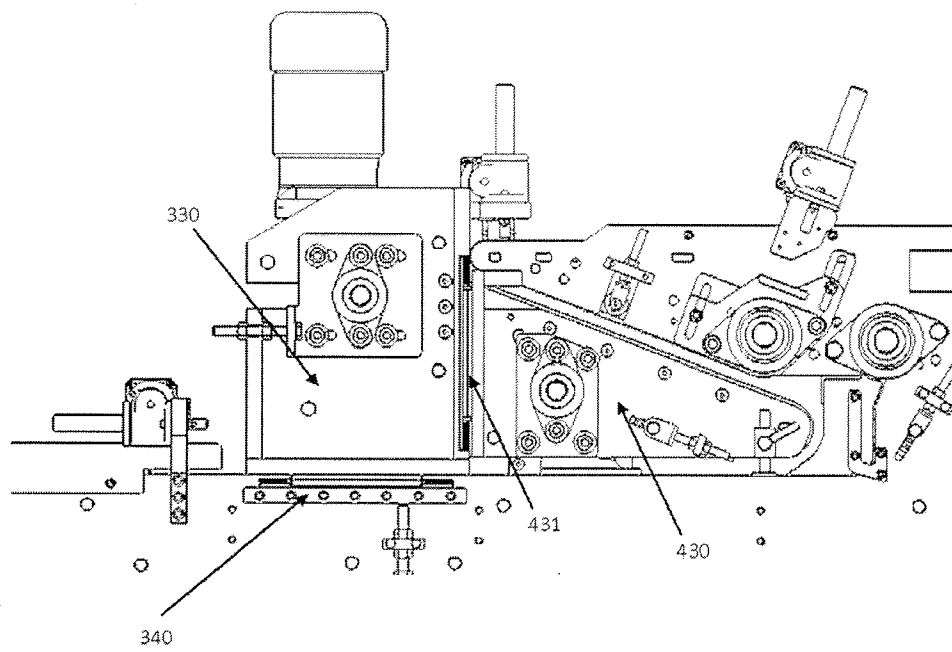


Fig. 3

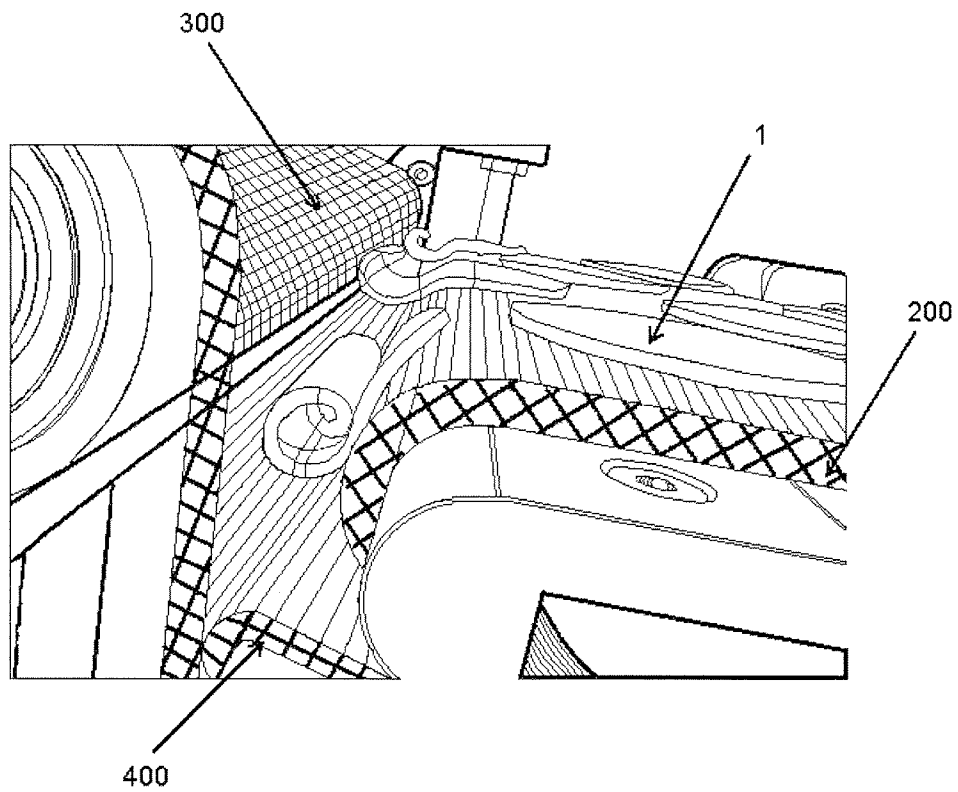


Fig. 4

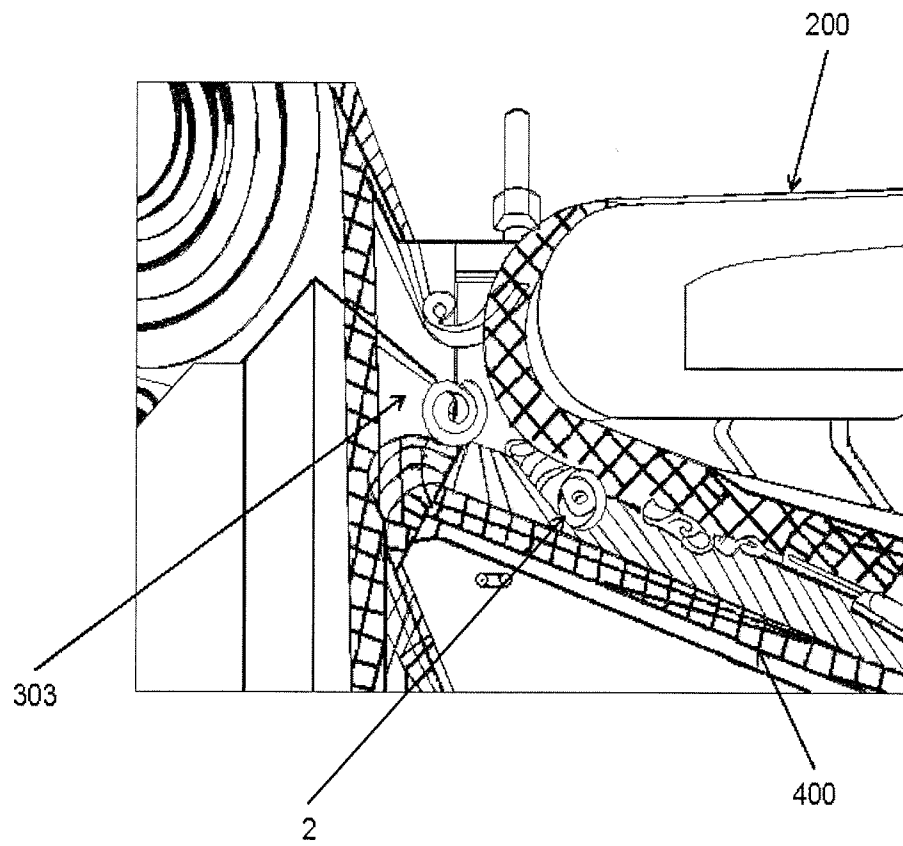


Fig. 5

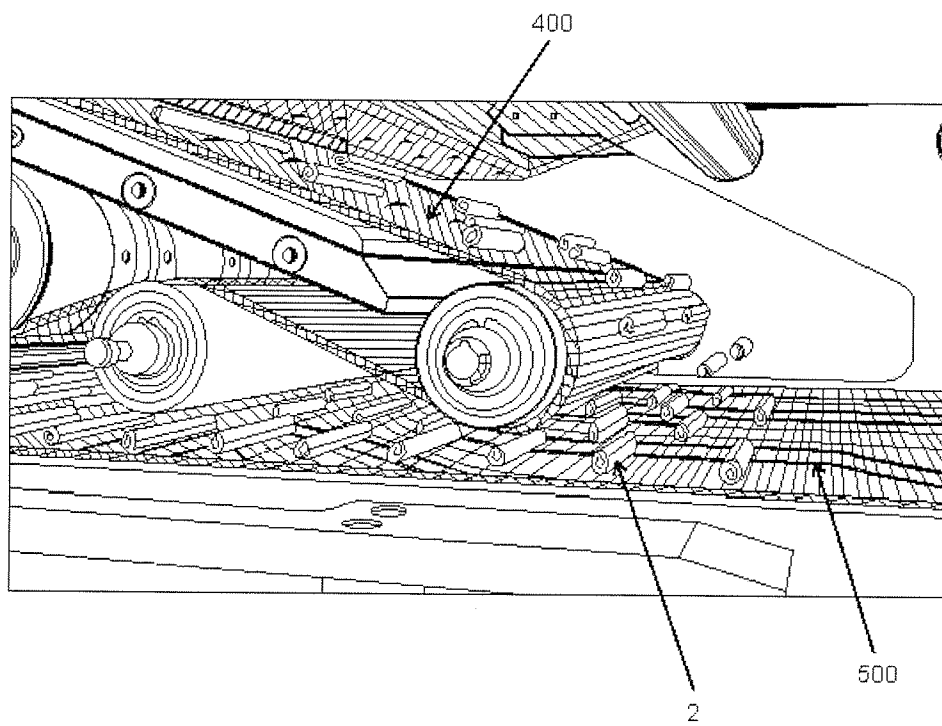


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 15/58531

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A21D 6/00, A21D 13/00, A47J 43/20 (2016.01)

CPC - A21D 6/00, A21D 13/00, A21D 13/0096, A23P 1/086, A47J 43/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8)- A21D 6/00, A21D 13/00, A23P 20/20, A47J 43/20 (2016.01)

CPC- A21D 6/00, A21D 13/00, A21D 13/0096, A23P 1/086, A47J 43/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC- 99/404, 99/443R, 99/450.2, 426/94, 426/438, 426/439, 426/500;

Patents and NPL (classification, keyword; search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Pub West (US EP JP WO), Pat Base (AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO), Google Patent, Google Scholar, Free Patents Online; search terms: laminate, dough, phyllo, food, roll, straw, wrap, coil, twist, bake, fry, direction, level, belt, velocity, convey, flex, track, rail

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2012/0308693 A1 (VAN BLOKLAND) 06 December 2012 (06.12.2012), Fig. 2; para [0008], [0035], [0038]	1-22
A	US 2006/0107846 A1 (FOULON et al.) 25 May 2006 (25.05.2006), Figs. 2, 4; para [0049]-[0051], [0054]	1-22
A	MX NL 04000037 A (UNIVERSIDAD AUTONOMA DE NUEVO LEON TORRE DE) 02 December 2005 (02.12.2005), English Abstract	1-22
A	EP 0 084 509 A (COMPTOIR DE L'INDUSTRIE ALIMENTAIRE) 27 July 1983 (27.07.1983), English Abstract	1-22
A	US 3,704,664 A (FISHER, JR.) 05 December 1972 (05.12.1972), Fig. 1; col 1, ln 44-57; col 2, ln 11 to col 3, ln 5	1-22

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search

22 February 2016

Date of mailing of the international search report

11 MAR 2016

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