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(84) Designated Contracting States: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR Designated Extension States: AL BA HR LV MK YU (71) Applicant: Monente Ploesser, Francisco 08490 Tordera (Barcelona) (ES) (72) Inventor: Monente Ploesser, Francisco 08490 Tordera (Barcelona) (ES)	(74) Representative: Esteban Perez-Serrano, Maria Isabel et al UDAPI & ASOCIADOS Explanada, 8 28040 Madrid (ES) <u>Remarks:</u> Amended claims in accordance with Rule 86 (2) EPC.
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(54) **Means for transferring foodstuffs from cutting machines to packaging machines**

(57) A collector robot (1) of products (8) cut and aligned on belts (2,3 and 4) at different levels, collected by means of intermediate belts (5) which deposit them in the recipients (6.1) of the conveyor belt (6) of a packing machine (7), the axes the belts (2,3,4,5 and 6) being arranged in the same vertical plane passing through the longitudinal axis of the packing machine, so that the belt (5) of reversible rotation repeats the direction of rotation of the belts (2,3 and 4) when it is located immediately below the final extremity of the said belts and rotates in the reverse direction, contrary to the displacement of the robot's arm (1), whilst the latter is tilted toward and brought nearer to the belt (6) piling in the containers products (8) either of the same or of different type.

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Description**OBJECT OF THE INVENTION**

5 [0001] The present invention relates to a means of transfer from cutting machines to packing machines of foodstuffs, of among the different means of preparation for the final packing of cut foodstuffs.

[0002] This invention is characterized in a special construction of these means based on, at least, a robot collector of slices or rashers from diverse conveyor belts of cut products and the transfer thereof to the recipients of the conveyor belt of a packing machine.

BACKGROUND OF THE INVENTION

15 [0003] The usual occurrence in the process of packing previously cut sausage, cheese, ham, paté and other items, is the indispensable manipulation thereof in certain points of the cutting procedure or of the packing, with the consequent drawbacks of a sanitary nature.

[0004] Another of the drawbacks of current practice is that of the slowness of the manual work and its repetitiveness thereof, which usually produces a diversity of problems in the production.

20 [0005] When dealing with high production facilities, the system of feeder belts, with a slight slope, is made to coincide with the belt of the packing machine, so that complete blocks of rows and columns are deposited in complete simultaneity and without hardly affecting the positioning of the product, taking into account the scant depth of the container.

[0006] In small plants and transversal to the cut product feeder belts, other belts are mounted for product collection and, in a new segment of the product transport line, said product is transferred to the container line.

25 [0007] The applicant is unaware of the existence of automatic means of manipulating rashers, portions and slices of foodstuffs that resolve the aforesaid problem with the simplicity and the effectiveness of the invention which is disclosed hereunder, using a robot for this purpose which does not operate with pincers or the like but instead incorporates some product transfer belts.

DESCRIPTION OF THE INVENTION

30 [0008] The present invention relates to some means of transfer from cutting machines to packing machines of a diversity of foodstuffs, of between all those different means collaborating in the reception, and preparation on the trays for the final packing of these previously cut foodstuffs.

35 [0009] This invention is characterized in a special construction of these means based on, at least, one robot collector of slices, or of portions or of rashers coming from diverse conveyor belts of cut products, arranged at different levels and with their longitudinal axes, preferably arranged in the same plane and their transfer to the recipients of the conveyor belt of a packing machine, having its axis preferably in the same plane as the other belts.

[0010] The robot has a mechanism of artificial vision which allows it to know the load condition of the product conveyor belts, a means of regulating the speed and the synchronism of these and of the container conveyor belt, as well as control of the dimensional adequacy of the received product.

40 [0011] A collection belt, of reversible motion, is mounted intermediately between the two preceding sets of belts and is, likewise, capable of antagonistic displacement to that of the robot's arm, so that it continues the direction of rotation the product feeder belts when it is under the final extremity of the same and is rotating in the reverse direction, opposite to that of the direction of rotation of the robot's arm, while the latter is also being tilted toward the belt transporting the containers, in which it piles the products, be these of the same type or of different type, since the feeder belts deliver these in frontal alignment with the same.

45 [0012] This invention is likewise characterized in a special construction of these means which make possible the incorporation of several robots in the same packing process, in an alternating arrangement of the same, so that collection of products and depositing of the same do not hinder the process and, moreover, the packing is faster in adequate synchronism and obviating steps in feeding the previously cut products to the various belts.

50 [0013] The invention is completed with some mechanical beacons, a collection of sensors and the appropriate connections.

DESCRIPTION OF THE DRAWINGS

55 [0014] The present descriptive specification is completed with a set of drawings which illustrate, without restricting the preferred embodiment of the invention.

[0015] Figure 1 is the view in perspective of one of the robots of the invention, of two successive views of its actuation, taking products from one of the belts delivering slices, portions or rashers with their intermediate belts and, in dashed

lines, the position of the arm depositing these products on the container belt.

[0016] Figure 2 is a detail in front view of the intermediate belt, the purpose being to better observe its construction.

PREFERRED EMBODIMENT OF THE INVENTION

[0017] In the light of the foregoing, the present invention relates to some means of transfer from cutting machines to packing machines of foodstuffs, of among the different means collaborating in the manipulation of these products, essentially characterized in having, at least, one robot (1) collecting products (8) in slices, portions or rashers, in alignment over various conveyor belts (2), (3) and (4), at different levels, by means of intermediate collector belts (5), for transporting these products (8) to the recipients (6.1) of the conveyor belt (6) of a packing machine (7), arranging the longitudinal axes of all the belts (2), (3), (4), (5) and (6) preferably in the same vertical plane passing through the longitudinal axis of the packing machine, so that the collection belt (5), of reversible rotation, repeats the direction of rotation of the product feeder belts (2), (3) and (4) when it is immediately below the final extremity of the same and it rotates in the reverse, contrary direction during the displacement of the robot's arm (1), whilst the latter is being tilted and brought nearer to the container conveyor belt (6), facilitating with this reverse rotation the piling in rows of the same of products (8) of the same or different type.

[0018] The robot (1) incorporates a mechanism of artificial vision which detects the dimensional adequacy of the product (8) and, given its facility to feed in discontinuous mode, the existence or not of the same on each column of the conveyor belts (2), (3) and (4), at the time of a specific collection, as well as having means for regulating the speed and the synchronism of the belts (2), (3), (4), (5) and (6) as well as the appropriate means of synchronous coordination between robots (1) when there are several of these in the same packing machine (7), alternating in the collection of products (8) delivered by the belts (2), (3) and (4) and in the depositing of said products on the trays (6.1) of the belt (6).

[0019] The belt (5) is multiple and has only one servo-motor (5.1) and a single axle common to all the rollers (5.2), the structure of the belt being maintained by a stainless steel plate (5.3) which minimizes the elevation of the end in counter-rotation, the object being to collect the product (8) smoothly, without a step in passing from the belts (2), (3) or (4).

[0020] The invention is completed with some mechanical beacons defining the enclosure of the machine and perimeter protectors of the same, for example in polycarbonate fencing, outside the figures, besides a collection of sensors which cooperate in managing the packing, for example, detecting portions or slices collected and not loaded or loaded and not packed, congestion of products (8) on belts (2), (3) and (4), for the starting order, indication of filling containers, etc.

[0021] The essential nature of this invention is not altered by variations in materials, form, size and arrangement of the component elements, described in a non-restrictive manner, sufficient for an expert to proceed to the reproduction thereof.

Claims

1. Means of transfer from cutting machines to packing machines of foodstuffs, of among the different means collaborating in the manipulation of these cut products, essentially **characterized in** having, at least, one robot (1) for collecting products (8) which incorporates in its arm one or several intermediate collector belts (5), destined to transport these products (8) in slices, portions or rashers, all of them coming from diverse conveyor belts (2), (3) and (4), these belts (5) delivering them into the recipients (6.1) of the conveyor belt (6) of a packing machine (7).
2. Means of transfer from cutting machines to packing machines of foodstuffs, according to the previous claim, **characterized in** having arranged in alignment at different levels, the conveyor belts (2), (3) and (4), as well as the intermediate collector belts (5) and the packing belt so that, preferably, the longitudinal axes of all the belts (2), (3), (4) and (6), as well as the central axis of the belts (5) are in the same vertical plane and also pass through the longitudinal axis of the packing machine.
3. Means for transfer of cutting machines to packing machines of foodstuffs, according to the previous claims, **characterized in that** the collection belt (5) is reversible in rotation and repeats the direction of rotation of the product feeder conveyors (2), (3) and (4) when it is located immediately below the final extremity of said belts and rotates in the reverse, contrary direction during the displacement of the robot's arm (1), while the latter is being tilted toward and brought nearer to the container conveyor belt (6), facilitating with this reverse rotation the piling in rows of these containers (8) of products, either of the same or of different type.
4. Means of transfer from cutting machines to packing machines of foodstuffs, according to the previous claims, **characterized in that** the robot (1) incorporates a mechanism of artificial vision which detects the dimensional adequacy of the product (8) and, given the possibility of feeding in discontinuous mode, the presence or not of the

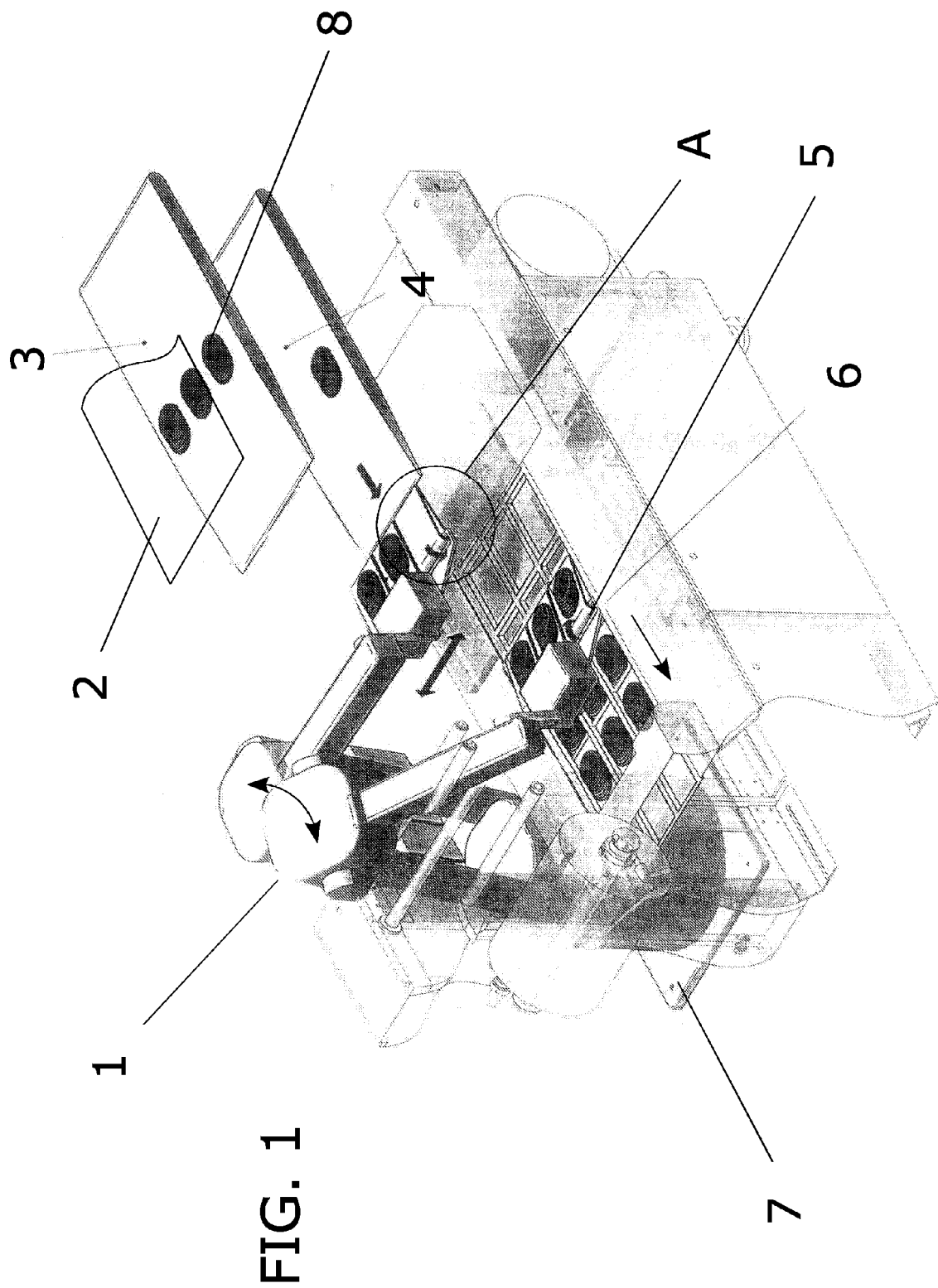
same in each column of the conveyor belts (2), (3) and (4), at the time of a specific collection, and also it has means for regulating the speed and the synchronism of the belts (2), (3), (4), (5) and (6).

- 5 5. Means of transfer from cutting machines to packing machines of foodstuffs, according to the previous claims, **characterized in that** the belt (5) is multiple and has a single servo-motor (5.1) and only one axle common to all the rollers (5.2), a stainless steel plate (5.3) maintaining the structure of the belt and minimizing the elevation of the end with counter-rotation, taking the product (8), without a step in passing from belts (2), (3) or (4) to belts (5).
- 10 6. Means of transfer from cutting machines to packing machines of foodstuffs, according to the previous claims, **characterized in** having several robots (1), as well as of the appropriate means of synchronous coordination between these in the same packing machine (7), alternating in the collection of products (8) delivered by the belts (2), (3) and (4) and in the depositing of the same on the trays (6.1) of the belt (6).
- 15 7. Means of transfer from cutting machines to packing machines of foodstuffs, according to the previous claims, **characterized in** incorporating a collection of sensors which cooperate in managing the packing, detecting portions or slices collected and not loaded or loaded and not packed, congestion of products (8) on belts (2), (3) and (4), for the starting order, indication of container fullness and others.

20 **Amended claims in accordance with Rule 86(2) EPC.**

1. Means of transfer from cutting machines to packing machines of foodstuffs, of among the different means collaborating in the manipulation of these cut products, essentially **characterized in that** it comprises:

- 25 - Product feeder conveyor belts (2,3,4)
- Container conveyor belt (6) provided with containers (6.1).
- On robot (1) for collecting the products (8) from the product feeder conveyor belts (2,3,4) and delivering them into the containers (6.1) of the conveyor belt (6) of a packing machine (7), being provided this robot (1) with arm with one or several intermediate collector belts (5) and being provided with a movement from the product
- 30 feeder conveyor belts (2,3,4) to the container conveyor belts (6) being tilting and brought.



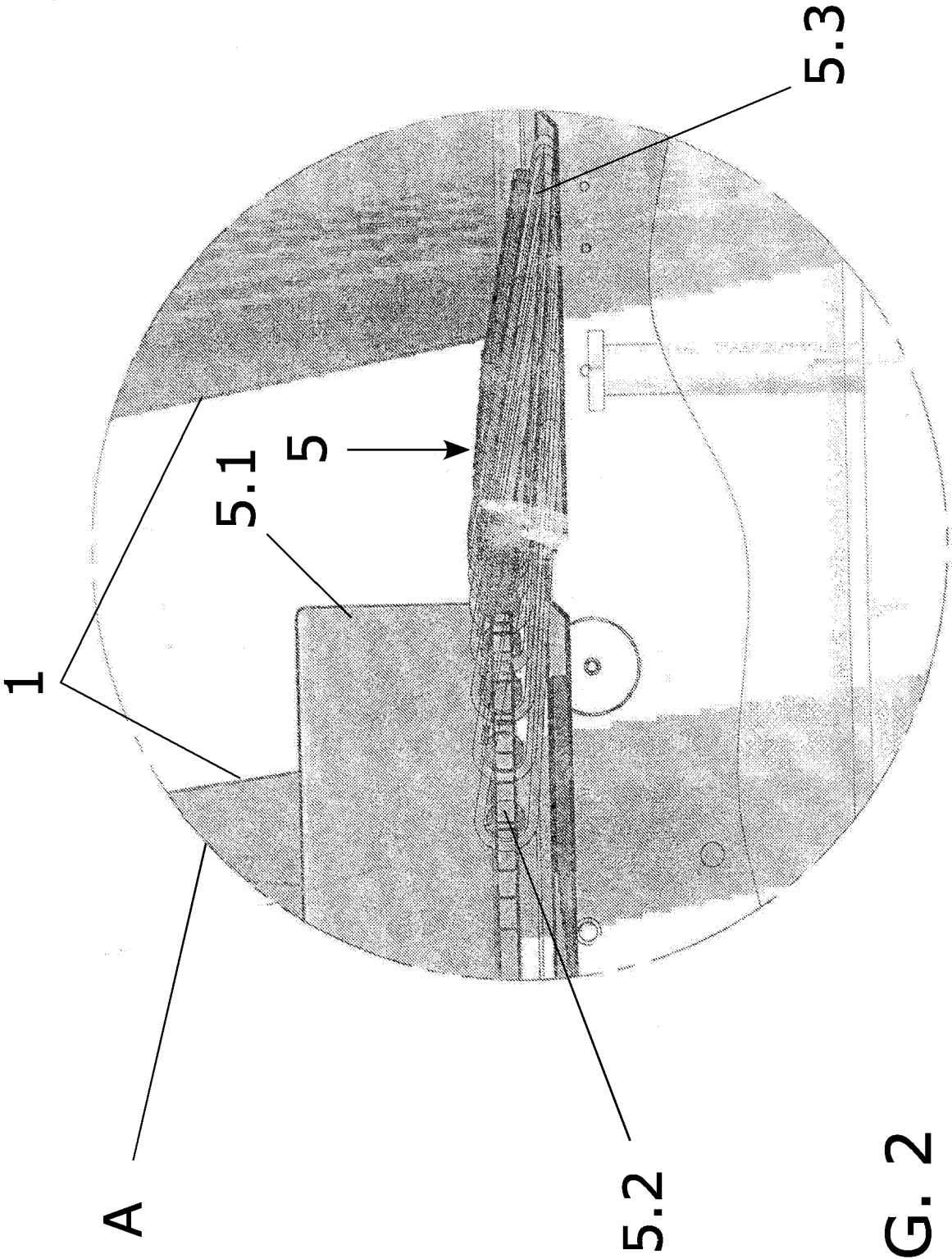


FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 05 38 1010

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 3 354 613 A (ANDERSON GEORGE W ET AL) 28 November 1967 (1967-11-28) * column 1, lines 12-25; figures 1-6 * -----	1,2	B65B25/06 B26D7/32
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65B B26D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 July 2005	Examiner Grentzius, W
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 38 1010

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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25-07-2005

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