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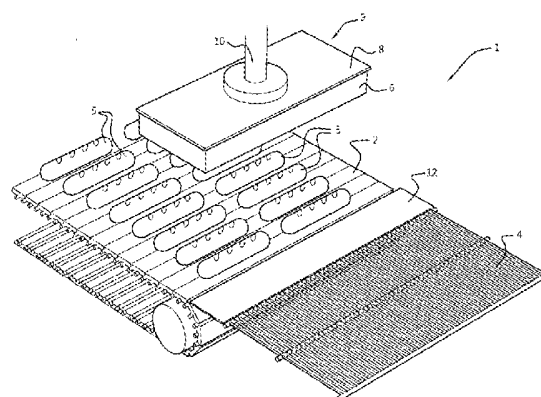
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(54)

Method and system for transferring baked dough pieces.

(57)

The invention relates to a method of transferring baked dough pieces (5) from a first product carrier (2) to a second product carrier (4). Resilient material (6) of a transferring unit (9) is positioned above an amount of baked dough pieces located on the first product carrier. Subsequently, the distance between the first product carrier and the resilient material is decreased until the resilient material is deformed by the amount of baked dough pieces between the resilient material and first product carrier. Then, the amount of baked dough pieces are transferred from the first product carrier to the second product carrier by moving the resilient material to a position above the second product carrier. The dough pieces are released by increasing the distance between the second transport carrier and the resilient material.



Method and system for transferring baked dough pieces

TECHNICAL FIELD

The invention relates to a method of transferring baked dough pieces
5 from a first product carrier to a second product carrier. The invention further
relates to a system for transferring baked dough pieces from a first product carrier
to a second product carrier.

10 BACKGROUND

US patent 3,603,271 discloses a method, wherein the transfer of
dough pieces is effected by an endless transfer belt with roller drive mounted in a
slide movable between a proofer transport and the oven and through two self-
supporting end edges where the belt is guided about relatively flat frames, so that
15 said end edges can be brought in close proximity to the supporting transport faces
of the dough pieces, whereby said dough pieces are drawn over the one edge on
the belt and deposited over the other edge on conveyer belt of the oven.

EP0063400 discloses the transfer of dough pieces from a proofer
transport on a continuously advancing oven underlay by means of a transfer belt
20 which is guided at one side about a roller drive and at the other self-supporting
end about a relatively flat frame. The transfer belt is movable over the proofer
transport to above the underlay, whereby a batch kept in ready position is taken up
from the proofer transport, which batch is deposited on the underlay consecutively
to a preceding batch, the above arrangement being controlled by sensors adjacent
25 the underlay and adjacent the proofer transport.

Before baking, proofed dough products have a non-sliding and more
or less sticky surface as a result of this the dough pieces do not slide over the
surface of the proofer transport when the dough pieces are drawn over the self-
supporting end edge of the transfer belt. After baking, the baked dough products
30 could easily slide over the surface of the conveyer belt of the oven. As a result of
this, the baked dough pieces could slide over the conveyer belt before they are
drawn over the self-supporting end edge. Consequently, the regular pattern of

dough pieces on the conveyer belt of the oven is changed in an irregular pattern of dough pieces on the transport surface of the transport medium after the over. It might even happen that dough pieces abut against each other.

For optimal cooling and freezing of baked dough pieces it is desired
5 that the dough pieces have a mutual distance which is similar to the mutual distance during the baking process. Furthermore, for packing machines it is advantageous when the dough pieces are supplied in a regular pattern and known pattern.

The method of transferring described above are further not suitable
10 in case the dough pieces are supplied on carriers having a corrugated sheet-like surface and have to be transferred to another product carrier.

SUMMARY

15 It is an object of the invention to provide an improved method of transferring baked dough pieces from a first product carrier to a second product carrier, to obviate at least one of the disadvantages, described above.

According to the invention, this object is achieved by a method having the features of Claim 1 and a device having the features of the independent
20 apparatus claim. Advantageous embodiments and further ways of carrying out the invention may be attained by the measures mentioned in the dependent claims.

According to a first aspect of the invention, there is provided a method of transferring baked dough pieces from a first product carrier to a second product carrier. Resilient material of a transferring unit is positioned above an
25 amount of baked dough pieces located on the first product carrier. Subsequently, the distance between the first product carrier and the resilient material is decreased until the resilient material is deformed by the amount of baked dough pieces located between the resilient material and first product carrier. Then, the amount of baked dough pieces are transferred from the first product carrier to the
30 second product carrier by moving the resilient material to a position above the second product carrier. The dough pieces are released by increasing the distance between the second transport carrier and the resilient material.

The invention is based on the recognition that most baked dough products are not sticky anymore and can slide over a surface or rack. By slightly clamping the baked dough products between a transport surface and a resilient material, the resilient material will be deformed by the products and will obtain a shape corresponding to the topside of the products. This gives the resilient material grip on the products and the capability to slide the products over the transport surface without changing the mutual distances or spacing between the products.

In an embodiment, during the transfer of the amount of baked dough pieces one of the product carriers is continuously moving and the other of the product carriers is stationary. It has been found that it is not necessary that both product carriers have to same movement when the products are slid from the first product carrier on the second product carrier. The continuously moving product carrier could be any type of belt conveyor with a smooth and non-sticky carrying surface in at least one direction and the other product carrier could be any type of a pallet or rack with a smooth and non-sticky carrying surface in at least one direction.

In an embodiment, the continuously moving product carrier transports the baked dough product in a transport direction at an end of belt conveyor with a transport speed, during the transfer the amount of baked dough pieces are moved in the transport direction with a velocity which is greater than the transport speed. These features allow providing a production line wherein all units are in-line.

In an embodiment, the first product carrier has a corrugated sheet-like transport structure with parallel grooves and ridges, during the transfer the baked dough pieces are moved in a direction parallel to the direction of the grooves and ridges. These features allows to transfer dough pieces from product carriers which have a flat carrier surface in only one direction to product carriers with a flat carrier surface in one or two directions. If the second product carrier has a flat carrier surface in only one direction, the spacing between grooves/ridges should be similar of both product carriers.

In an embodiment, the resilient material comprises at least one material taken from a group comprising: a layer of foam, a layer of silicone, a brush-like layer of a flexible material, a layer of spaced strips of flexible material perpendicular to the transfer direction. A common feature of all types of material is
5 that the material forms a layer-like structure above an amount of dough pieces which is deformed or compressed by all dough pieces between the resilient material and the carrier surface of a product carrier during transfer from a start location on the first product carrier to the final location on the second product carrier.

10 According to a second aspect of the invention, there is provided a system for transferring baked dough pieces comprising a first product carrier, a second product carrier and a transferring unit. The transferring unit is configured for transferring the baked dough pieces from the first product carrier to the second product carrier. The transferring unit comprises a driving section, resilient material
15 attached to a movable end of the driving section and a control section. The control section is configured to control the driving section to position the resilient material of the transferring unit above an area of the first product carrier, to control the driving section to decrease the distance between the first product carrier and the resilient material until the resilient material is deformed by an amount of baked
20 dough pieces located at the area of the first product carrier below the resilient material, to control the driving section to move the resilient material from the position above the first product carrier to a position above to the second product carrier and simultaneously transferring the amount of baked dough pieces from the first product carrier to the second product carrier and to control the driving section
25 to move the resilient material to increase the distance between the second transport carrier and the resilient material to release the baked dough pieces on the second transport carrier.

According to a third aspect of the invention, there is provided an arrangement comprising all technical features of a

30 Other features and advantages will become apparent from the following detailed description, taken in conjunction with the accompanying drawings which illustrate, by way of example, various features of embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects, properties and advantages will be explained hereinafter based on the following description with reference to the drawings, wherein like reference numerals denote like or comparable parts, and in which:

Fig. 1 illustrates a perspective view of a system for transferring baked dough pieces;

Figs. 2a – 2d illustrate the steps of a method of transferring baked dough pieces;

Figs. 3a – 3b illustrate an alternative embodiment of a layer of resilient material;

Fig. 4 illustrates the application of a product carrier with an alternative carrier surface;

Fig. 5 illustrates a sectional view of the product carrier shown in Fig. 4; and,

Fig. 6 illustrates a sectional view of an alternative embodiment of a product carrier.

DETAILED DESCRIPTION

Fig. 1 illustrates a perspective view of a system 1 for transferring baked dough pieces 5 from a first product carrier 2 to a second product carrier 4. The system further comprises a transferring unit 9. The transferring unit 9 comprises a driving section, a layer-like structure of resilient material 6 and a control section (not shown). The layer-like structure of resilient material 6 is attached to a movable end part 10 of the driving section. The driving section could be any suitable arrangement to move a movable end part along at least two axis, i.e. horizontally in at least one direction and vertically. The control section is configured to move the movable end part 10 of the driving section with respect to the first and second product carrier along a predefined path of positions. Two non-limiting examples of a driving section are a robot arm and a gantry robot. As the

structure of the driving section is not an essential feature only the movable end part 10 of the driving section is shown. In Fig. 1 the first product carrier 2 is in the form of an endless belt. The endless belt is formed by chains which top surface is covered with strips of stone. In principle any bent conveyor type could be used which surface is flat in at least one direction, is non-sticky and allows the baked-dough pieces to slid in at least one direction over its surface. Other examples of a conveyor type belt are: mesh belts, grade belts and rod conveyor. In Fig. 1, the second product carrier 4 is in the form of a rack. The rack could be made of metal wires or plastic.

The layer-like structure of resilient material 6 in Fig. 1 is a layer of foam. Examples of foam are polyethylene foam, polyurethane foam, and neoprene. The layer of resilient material 6 is attached to a support structure 8 in the form of a plate. The support structure 8 is attached to the movable end part 10 of the driving section 9. The layer of resilient material 8 is positioned parallel to the surface of the first and second product carrier. In an embodiment of the layer of resilient material comprises a foam layer which is covered with a thin layer of silicone.

Fig. 1 further shows an auxiliary sliding structure 12. The auxiliary sliding structure 12 is only necessary if the first and second product carrier do not form a contiguous sliding surface to slide the baked dough pieces from the first product carrier to the second product carrier.

Figs. 2a – 2d illustrate the steps of a method of transferring baked dough pieces. Shown is a side view of the system 1 of Fig. 1. Fig. 2a shows the starting of the method. Shown are a continuously moving conveyor belt, the first product carrier 2, and a stationary rack, the second product carrier 4. An auxiliary sliding structure 12 is provided between the first product carrier and the second product carrier to form one smooth sliding surface. Baked dough pieces are transported to an end part of the conveyor belt. The layer of resilient material 6 is moved to a starting position above the end part of the first product carrier. The control unit of the transferring unit 9 controls the driving section to move the movable end part to said position. A sensor (not shown) detects when an amount of baked dough pieces is located below the resilient material. After detection, the

distance between the first product carrier 2 and the resilient material 6 is decreased by the driving section until the resilient material is deformed by the amount of baked dough pieces 5 between the resilient material and the first product carrier. The resilient material is shaped in a form corresponding to the
 5 topside of the baked dough pieces. A part of the resilient material is located between the baked dough pieces. Fig. 2b illustrates this process step. In this process step the control unit instructs the driving section to move down the movable end part of the driving section.

In the present embodiment, the distance is decreased by moving the
 10 resilient material down. In principle it might also be possible to move the first product carrier up. However, repeatedly increasing and lowering the level of a continuous moving belt is not a very practical solution.

Subsequently, as illustrated in Fig. 2c the amount of baked dough pieces is transferred from the first product carrier to the second product carrier by
 15 moving the resilient material 6 to a position above the second product carrier 4. The resilient material 6 is moved parallel to the top surface of the first and second product carrier. As a result, the baked dough pieces are not further compressed during the transfer. The velocity of the movement of the resilient material is greater than the transport speed of the first product carrier.

It can be seen that the dough pieces have to slide over the auxiliary
 20 sliding structure. It can further be seen that the level of an edge of the top surface of the auxiliary sliding structure is aligned with an edge of the top surface of the first product carrier over which the dough pieces 5 are removed from the first product carrier. The level of the auxiliary sliding structure should not be higher
 25 than the level of the first product carrier to avoid that a dough piece sticks behind the edge and consequently disrupts the regular spacing between the dough pieces. The same applies for the neighbouring edges of the auxiliary sliding structure and the second product carrier. The edge of the second product carrier should not be higher than the neighbouring edge of the auxiliary sliding structure.

In Fig. 2d, the dough pieces 5 are released by increasing the
 30 distance between the second transport carrier 4 and the resilient material 5. The control unit controls the driving section to move the movable end part 10 upwards.

It might be clear to the skilled person, that it might also be possible to move down the second object carrier to release the dough pieces 5.

In Fig. 2e, the resilient material 6 is moved back to the starting position above the first object carrier 2. In the meantime, the first object carrier
 5 has transported an amount of dough pieces to the end part of the conveyor belt 2 and the steps described above are repeated.

The control section is configured to perform repeatedly the following loop: to control the driving section to position the resilient material of a transferring unit above a predefined area of the first product carrier, to control the driving
 10 section to decrease the distance between the first product carrier and the resilient material until the resilient material is deformed by an amount of baked dough pieces located at the area of the first product carrier below the resilient material, to control the driving section to move the resilient material from the position above the first product carrier to a position above to the second product carrier and
 15 simultaneously transferring the amount of baked dough pieces from the first product carrier to the second product carrier and to control the driving section to move the resilient material to increase the distance between the second transport carrier and the resilient material to release the baked dough pieces on the second transport carrier and to control the driving section to return the resilient material
 20 above the predefined area of the first product carrier.

Figs. 2a ... 2e illustrate that in one cycle only one half of the second product carrier 4 is filled dough pieces. Thus two cycles are needed to fill the complete width of the second product carrier 4.

In another embodiment, the width of the conveyor belt, first product
 25 carrier, and the length of the rack, the second product carrier, are similar and the size of the resilient layer corresponds to the dimensions of the rack. In this embodiment the second product carrier is filled with dough pieces in one cycle.

From the figures 2a – 2e can further be seen that the surfaces of the first product carrier 2, second product carrier 4 and the auxiliary sliding structure
 30 12 form a contiguous sliding surface.

Figs. 3a – 3b illustrates an alternative embodiment of a layer of resilient material 60. In this embodiment, the layer of resilient material is a brush-

like layer of a flexible material. The bristles of the brush-like layer are deformed when the tops of the bristles touch a dough piece. The bristles are flexible enough no to damage the dough pieces and stiff and rough enough to have grip on the dough pieces and to slide them over the surfaces of the product carriers. In a further embodiment, the layer of resilient material is a layer of spaced strips of flexible material. The spaced strips are preferable positioned perpendicular to the transfer direction. This orientation provides the optimal grip on the dough pieces. The product carrier 2' represents both the first and second product carrier. The brush-like layer and layer of space strips could be made from silicone or the like.

Fig. 4 illustrates the application of a product carrier with an alternative carrier surface and Fig. 5 illustrates a sectional view of the product carrier shown in Fig. 4. The method of transferring baked dough pieces described above could also be applied on product carrier having a corrugated sheet-like transport structure with parallel grooves and ridges. In Fig. 4 and 5 a wired rack forming grooves and ridges is shown. As the dough pieces extend above the ridges, the resilient material could still be deformed by the dough pieces without touching the top surface of the product carrier. During the transfer the baked dough pieces are moved in a direction parallel to the direction of the grooves and ridges from the first product carrier to the second product carrier. The spacing of the product on the second product carrier will be similar to the spacing on the first object carrier, i.e. the space of the grooves. Fig. 6 illustrates a sectional view of an alternative embodiment of a product carrier, wherein the product carrier 22 is a corrugated sheet.

In an embodiment, the transferring unit is further configured to obtain a rack, i.e. a second product carrier, from a pile of racks in case the supply of empty racks is irregular and the first product carrier supplies a constant stream of baked dough pieces. In addition to the layer of resilient material, the movable end part of the driving section comprises gripping means configured to grip a rack if the layer of resilient material touches or is positioned above a rack. Some embodiment of gripping means are: suction cups and movable hooks. The system detects when an empty rack could not be delivered by a conveyor system in time at the loading position where the rack is loaded with baked dough pieces by the

transferring unit. This could be by a sensor somewhere along the conveyor system upstream the conveyor system of second product carriers. Then the control unit instructs the driving section to move the free end part of the transferring unit above a pile of racks stacked near the loading position where the second product carrier is loaded with products transferred from the first object carrier. A rack is then coupled to the free end part by the gripping means and the control unit instructs the driving section to position the rack at the loading position. The rack is released and subsequently the method described above to transfer baked dough pieces from a first object carrier to a second object carrier is performed. In a similar manner, if the stream of empty racks is temporarily higher than the stream of baked dough pieces on the first product carrier to fill the empty racks, an empty rack could be temporarily removed from the stream and put on a stack of racks near the loading position. In this way, the transferring unit is used to manage a buffer of racks as a result of which no baked dough pieces on a continuously moving belt has to fall over the end of the belt on the ground.

The method described above enables to transfer dough pieces from first object carriers having a flat or corrugated carrier surface to a second object carrier having a flat carrier surface. It is further possible to transfer dough pieces from a corrugated first product carrier to a corrugated second product carrier having the same spacing between the grooves.

The method described above enables to transfer dough pieces from a continuously moving belt conveyor another continuously belt conveyor without changing the spacing between the dough pieces. The speed of the belt conveyors should be the same. It is further possible to apply the present method of transfer for transferring dough pieces on a continuously moving belt conveyor moving in a first direction on a belt conveyor moving in a second direction which is perpendicular to the first direction. This allows changing the width of the stream of dough pieces without changing the spacing between the pieces. The spacing is important during various steps of the baked dough pieces production, for example: baking, cooling, freezing and packaging.

The method described above is further suitable to transfer baked dough pieces from a rack with a flat surface to another rack with a flat surface.

The dimensions of the racks may be similar or different. Furthermore, the racks could be stationary during transfer of the pieces. It might also be possible to transport the racks next to each other in the same direction with similar speed during the transfer of dough pieces.

5 In the description above at the start of transfer the resilient material is positioned above the first object carrier. It might be clear that this also implies that the first object carrier is positioned in a predefined position and that subsequently a rack or pallet with baked dough pieces, the first object carrier, is positioned below the resilient material.

10 The method could be applied with conveyor belts having a width in the range of 1 up to 5 meter or more and racks with any dimensions.

 In case the rack is in the form of wire frames, the spacing between two wires should not be too large. If the spacing is too large, the wires do not form a smooth surface any more for sliding the baked dough pieces. It has been found
15 that a spacing in the range of 10 – 20 mm, and in particular 15 mm is very suitable when the objects are slid over the racks in a direction parallel to the directions of the wires. However is the objects are moved in a direction perpendicular to the direction of the wires, the spacing should be smaller. Furthermore, the spacing in general depends on the size of the baked dough pieces.

20 The method could be applied for transferring both artisanal made dough products as machine made dough products not having a brittle and/or sticky exterior.

 While the invention has been described in terms of several embodiments, it is contemplated that alternatives, modifications, permutations and
25 equivalents thereof will become apparent to those skilled in the art upon reading the specification and upon study of the drawings. The invention is not limited to the illustrated embodiments. Changes can be made without departing from the scope of the invention.

CONCLUSIES:

1. Werkwijze voor het overzetten van gebakken deegstukken van een eerste productdrager naar een tweede productdrager, **gekenmerkt door**
 - 5 - het positioneren van veerkrachtig materiaal van een overzeteenheid boven een hoeveelheid gebakken deegstukken op de eerste productdrager;
 - het verminderen van de afstand tussen de eerste productdrager en het veerkrachtig materiaal totdat het veerkrachtige materiaal wordt vervormd door de hoeveelheid gebakken deegstukken tussen het veerkrachtige materiaal en de
 - 10 eerste productdrager;
 - het overzetten van de hoeveelheid gebakken deegstukken van de eerste productdrager naar de tweede productdrager door het veerkrachtige materiaal te bewegen naar een positie boven de tweede productdrager; en
 - het vrijgeven van de deegstukken door de afstand tussen de tweede
 - 15 transportdrager en het veerkrachtig materiaal te vergroten.

2. De werkwijze volgens conclusie 1, waarbij de gebakken deegstukken schuiven over de eerste productdrager en de tweede productdrager tijdens het overzetten.
- 20
3. De werkwijze volgens conclusie 1 of 2, waarbij tijdens het overzetten van de hoeveelheid gebakken deegstukken een van de productdragers continu beweegt en de andere van de productdragers stilstaat.

- 25 4. De werkwijze volgens conclusie 3, waarbij de continu bewegende productdrager een bandtransporteur is en de andere productdrager een pallet of rek is.

5. De werkwijze volgens conclusie 4, waarbij de continu bewegende
- 30 productdrager de gebakken deegproduct in een transportrichting transporteert aan een einde van de transportband met een transportsnelheid, tijdens het overzetten

worden de hoeveelheid gebakken deegstukken verplaatst in de transportrichting met een snelheid die groter is dan de transportsnelheid.

5 6. De werkwijze volgens een van de conclusies 1 - 5, waarbij de eerste productdrager een golfplaat-achtige transportconstructie met parallelle groeven en ruggen heeft, tijdens het overzetten worden de gebakken deegstukken bewogen in een richting evenwijdig aan de richting van de groeven en ruggen.

10 7. De werkwijze volgens een van de conclusies 1 - 6, waarbij het veerkrachtige materiaal ten minste een materiaal omvat uit een groep omvattende: een schuimlaag, een laag van siliconen, een borstelachtige laag van een flexibel materiaal, een laag met op afstand geplaatste stroken van flexibel materiaal die loodrecht op de overzetricting staan.

15 8. Systeem (1) voor het overzetten van gebakken deegstukken (5) omvattende een eerste productdrager (2), een tweede productdrager (4) en een overzeteenheid voor het overzetten van de gebakken deegstukken van de eerste productdrager naar de tweede productdrager, **met het kenmerk dat**, de overzeteenheid (9) een aandrijfsectie, veerkrachtig materiaal (6) vastgemaakt aan
20 een beweegbare einddeel (10) van de aandrijfsectie en een besturingsgedeelte omvat, het besturingsgedeelte is geconfigureerd om de aandrijfsectie te besturen om het veerkrachtig materiaal van een overzeteenheid boven een oppervlak van de eerste productdrager te positioneren, de aandrijfsectie te besturen om de afstand tussen de eerste productdrager en het veerkrachtig materiaal te verkleinen
25 totdat het veerkrachtige materiaal wordt vervormd door een hoeveelheid gebakken deegstukken op het oppervlak van de eerste productdrager onder het veerkrachtige materiaal, de aandrijfsectie te besturen om het veerkrachtige materiaal te verplaatsen van de positie boven de eerste productdrager naar een positie boven de tweede productdrager en tegelijkertijd het overzetten van de
30 hoeveelheid gebakken deegstukken van de eerste productdrager naar de tweede productdrager en de aandrijfsectie te besturen om het veerkrachtige materiaal te verplaatsen teneinde de afstand te vergroten tussen de tweede transportdrager en

het veerkrachtig materiaal, teneinde de gebakken deegstukken vrij te geven op de tweede transportdrager.

9. Het systeem volgens conclusie 8, waarbij een van de productdragers
5 geconfigureerd is om continu te bewegen en de andere van de productdragers
stilstaat wanneer het veerkrachtige materiaal wordt bewogen vanuit een positie
boven de eerste productdrager naar een positie boven de tweede productdrager.

10. Het systeem volgens conclusie 9, waarbij de continu bewegende
10 productdrager een transportband is en de andere productdrager een pallet of rek
is.

11. Het systeem volgens conclusie 9, waarbij de continu bewegende
productdrager aan een einde van transportband de gebakken deegproduct in een
15 transportrichting transporteert met een transportsnelheid, het besturingsgedeelte is
geconfigureerd om de aandrijfsectie te besturen om de veerkrachtige materiaal te
verplaatsen in de transportrichting van de positie boven de eerste productdrager
naar een positie boven de tweede productdrager met een snelheid die groter is
dan de transportsnelheid.

20

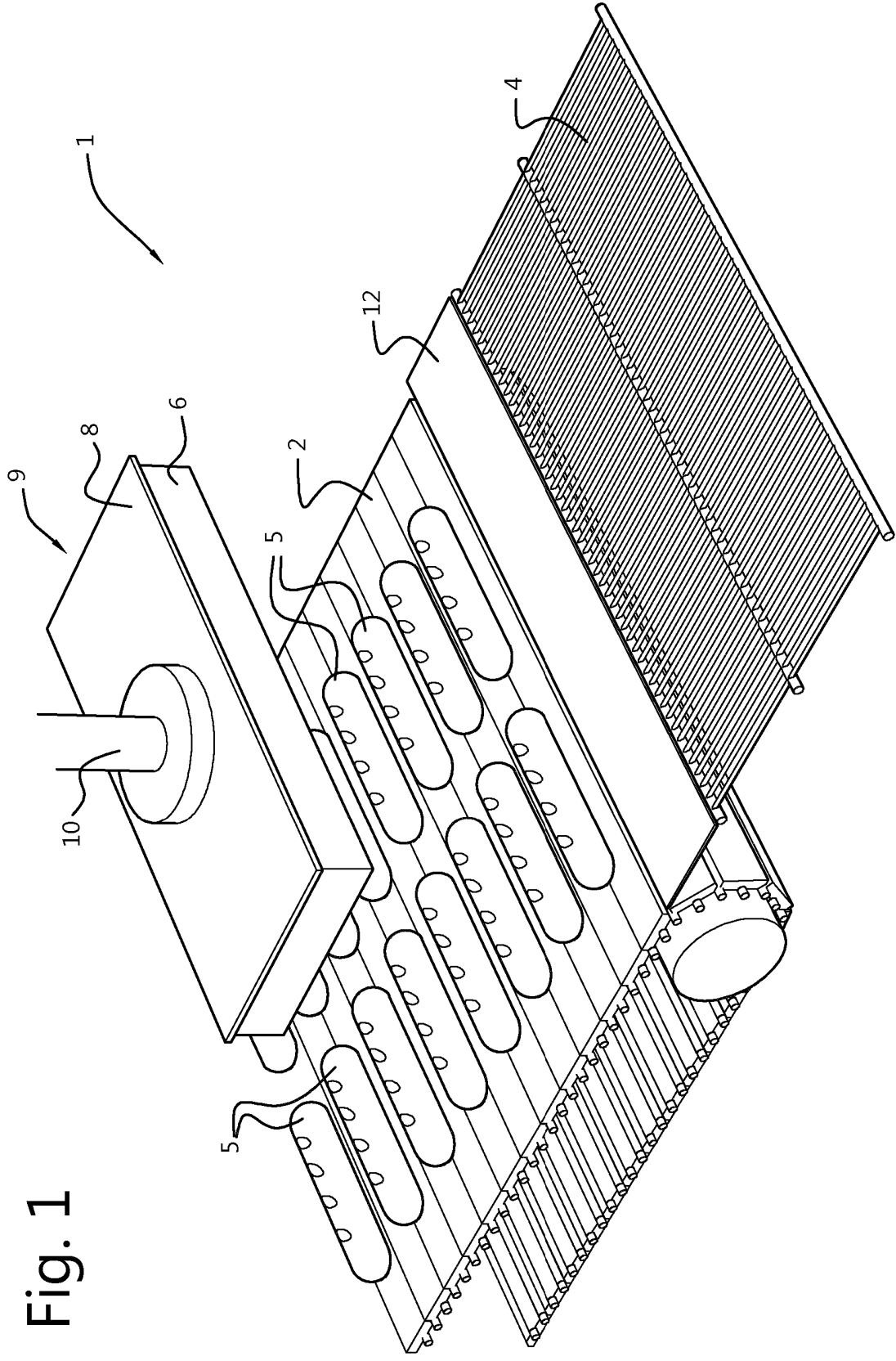
12. Het systeem volgens conclusie 9 of 10, waarbij het systeem verder
een aanvullende glijvlak tussen de eerste productdrager en de productdrager
tweede omvat, tegenover elkaar gelegen randen van het aanvullende glijoppervlak
liggen in lijn met de eerste productdrager en de tweede productdrager teneinde
25 een aaneengesloten glijoppervlak te vormen.

13. Het systeem volgens een der conclusies 8 - 12, waarbij de eerste
productdrager een golfplaat-achtige transportconstructie heeft met parallelle
groeven en ruggen, om de gebakken deegstukken over te zetten is het
30 besturingsgedeelte geconfigureerd om het veerkrachtige materiaal te bewegen in
een richting evenwijdig aan de richting van het groeven en richels.

14. Het systeem volgens een van de conclusies 8 - 13, waarbij het veerkrachtige materiaal ten minste een materiaal is uit een groep omvattende: een schuimlaag, een laag van siliconen, een borstelachtige laag van een flexibel materiaal, een laag met op afstand geplaatste stroken van flexibel materiaal die
5 loodrecht op de transportrichting staan.

15. Inrichting omvattende alle technische kenmerken van een overzeteenheid volgens een van de conclusies 8 - 14.

Fig. 1



ABSTRACT

The invention relates to a method of transferring baked dough pieces (5) from a first product carrier (2) to a second product carrier (4). Resilient material (6) of a transferring unit (9) is positioned above an amount of baked dough pieces located on the first product carrier. Subsequently, the distance between the first product carrier and the resilient material is decreased until the resilient material is deformed by the amount of baked dough pieces between the resilient material and first product carrier. Then, the amount of baked dough pieces are transferred from the first product carrier to the second product carrier by moving the resilient material to a position above the second product carrier. The dough pieces are released by increasing the distance between the second transport carrier and the resilient material.

Figure 1.

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE		KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE	
		0062P-NL	
Nederlands aanvraag nr.		Indieningsdatum	
2012584		07-04-2014	
		Ingeroepen voorrangsdatum	
Aanvrager (Naam)			
BAKE-INVENT B.V.			
Datum van het verzoek voor een onderzoek van internationaal type		Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.	
01-07-2014		SN 62303	
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)			
Volgens de internationale classificatie (IPC)			
A21B3/07 A21C9/08 A21C15/00 B65G47/52 B65G47/82			
II. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK			
Onderzochte minimumdocumentatie			
Classificatiesysteem	Classificatiesymbolen		
IPC	A21B	A21C	B65G B65B
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen			
III.	☐	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)	
IV.	☐	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)	

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2012584

A. CLASSIFICATIE VAN HET ONDERWERP
INV. A21B3/07 A21C9/08 A21C15/00 B65G47/52 B65G47/82
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
A21B A21C B65G B65B

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	GB 326 495 A (T AND T VICARS LTD; EDWARD MILNER CROSLAND) 10 maart 1930 (1930-03-10) * figuren 1-4 * * bladzijde 1, regels 81-91 * * bladzijde 2, regels 69-91 * * bladzijde 3, regels 5-40,70-98 * -----	1-15
X	GB 456 747 A (ROBERT FRENCH MACFARLANE; BAKER PERKINS LTD) 13 november 1936 (1936-11-13) * figuren 1,5 * * bladzijde 1, regel 102 - bladzijde 2, regel 28 * * bladzijde 2, regels 77-113 * ----- -/-	1,8,12,15

☒ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

10 september 2014

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

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NL - 2280 HV Rijswijk
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De bevoegde ambtenaar

De Meester, Reni

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2012584

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN		
Categorie *	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	GB 338 706 A (T AND T VICARS LTD; EDWARD MILNER CROSLAND) 27 november 1930 (1930-11-27) * het gehele document *	1,8,15
X	DE 22 62 888 A1 (WINKLER KG F) 11 juli 1974 (1974-07-11) * figuur 1 * * bladzijde 3 *	1,8,15
A	US 2 773 583 A (RAND KENNETH R ET AL) 11 december 1956 (1956-12-11) * kolom 2, regels 41-45 *	6,13
A	EP 1 086 912 A1 (BARILLA ALIMENTARE SPA [IT]) 28 maart 2001 (2001-03-28) * het gehele document *	1-15

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2012584

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
GB 326495	A	10-03-1930	GEEN
GB 456747	A	13-11-1936	GEEN
GB 338706	A	27-11-1930	GEEN
DE 2262888	A1	11-07-1974	GEEN
US 2773583	A	11-12-1956	GEEN
EP 1086912	A1	28-03-2001	AT 261390 T 15-03-2004
		DE 69915473 D1	15-04-2004
		DE 69915473 T2	10-03-2005
		DK 1086912 T3	12-07-2004
		EP 1086912 A1	28-03-2001
		ES 2217729 T3	01-11-2004
		PT 1086912 E	30-06-2004
		SI 1086912 T1	31-08-2004

WRITTEN OPINION

File No. SN62303	Filing date (day/month/year) 07.04.2014	Priority date (day/month/year)	Application No. NL2012584
International Patent Classification (IPC) INV. A21B3/07 A21C9/08 A21C15/00 B65G47/52 B65G47/82			
Applicant BAKE-INVENT B.V.			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☒ Box No. VIII Certain observations on the application

	Examiner De Meester, Reni
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WRITTEN OPINION

Application number
NL2012584

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	3-6, 9-13
	No: Claims	1, 2, 7, 8, 14, 15
Inventive step	Yes: Claims	
	No: Claims	1-15
Industrial applicability	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations

see separate sheet

WRITTEN OPINION

Application number
NL2012584

Box No. VIII Certain observations on the application

see separate sheet

Re Item VIII

Certain observations on the application

Claims 9 and 11 are not clear.

- 1 The feature " en de andere van de productdragers **stilstaat**" in the apparatus **claim 9** relates to a method of using the apparatus rather than clearly defining the apparatus in terms of its technical features. The intended limitations are therefore not clear from this claim.
- 2 The feature " waarbij de continu bewegende productdrager aan een einde van transportband de gebakken deegproduct in een transportrichting **transporteert** met een transportsnelheid" in the apparatus **claim 11** relates to a method of using the apparatus rather than clearly defining the apparatus in terms of its technical features. The intended limitations are therefore not clear from this claim.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- | | |
|----|--|
| D1 | GB 326 495 A (T AND T VICARS LTD; EDWARD MILNER CROSLAND)
10 maart 1930 (1930-03-10) |
| D2 | GB 456 747 A (ROBERT FRENCH MACFARLANE; BAKER PERKINS LTD) 13 november 1936 (1936-11-13) |
| D3 | GB 338 706 A (T AND T VICARS LTD; EDWARD MILNER CROSLAND)
27 november 1930 (1930-11-27) |
| D4 | DE 22 62 888 A1 (WINKLER KG F) 11 juli 1974 (1974-07-11) |
| D5 | US 2 773 583 A (RAND KENNETH R ET AL) 11 december 1956
(1956-12-11) |

1 Independent claim 1: Novelty

The present application does not meet the criteria of patentability, because the subject-matter of **claim 1** is not new, for the following reasons:

- 1.1 Document D1 discloses a werkwijze voor het overzetten van gebakken deegstukken van een eerste productdrager naar een tweede productdrager (page 1, lines 81-91), met de volgende stappen:
- het positioneren van veerkrachtig materiaal van een overzeteenheid boven een hoeveelheid gebakken deegstukken op de eerste productdrager (figure 1-2; page 3, lines 7-15);
 - het verminderen van de afstand tussen de eerste productdrager en het veerkrachtig materiaal totdat het veerkrachtige materiaal wordt vervormd door de hoeveelheid gebakken deegstukken tussen het veerkrachtige materiaal en de eerste productdrager (figures 1-2, page 3, lines 20-26);
 - het overzetten van de hoeveelheid gebakken deegstukken van de eerste productdrager naar de tweede productdrager door het veerkrachtige materiaal te bewegen naar een positie boven de tweede productdrager (figures 1-2, page 3, lines 26-33 and 85-98); en
 - het vrijgeven van de deegstukken door de afstand tussen de tweede transportdrager en het veerkrachtig materiaal te vergroten (figures 1-2, page 3, lines 34-41).
- 1.2 Moreover, also documents D2 (figures 1 and 5; page 1, line 102- page 2, line 28; page 2, lines 77-113), D3 (figures 1-4; page 2, lines 6-54) and D4 (figure 1; page 3) disclose all the technical features of claim 1
- 1.3 Hence, **claim 1** is not new in view of document D1 (or D2, D3 or D4)

2 **Independent claim 8: Novelty**

- 2.1 The present application does not meet the criteria of patentability, because the subject-matter of **claim 8** is not new, for the following reasons:
- 2.2 Document D1 discloses a systeem voor het overzetten van gebakken deegstukken (page 1, lines 81-91) omvattende een eerste productdrager ((1)+(2)+(3) figure 1-2; page 3, lines 7-15), een tweede productdrager ((34) figure 1-2; page 3, lines 26-33) en een overzeteenheid ((7)-(10) figures 1-2, page 3, lines 26-33 and 85-98); voor het overzetten van de gebakken deegstukken van de eerste productdrager naar de tweede productdrager, met het kenmerk dat, de overzeteenheid een aandrijfsectie (implicit as it is necessary for the movement of the brushes; ((7)-(10) figures 1-2, page 3, lines 26-33 and 85-98)), veerkrachtig materiaal (flexible part of the brushes ((7)-(10) figures 1-2, page 3, lines 26-33 and 85-98)) vastgemaakt aan een beweegbare einddeel van de aandrijfsectie en een besturingsgedeelte omvat, het besturingsgedeelte ((12)+(13) figures 1-2, page 3, lines 12-20) is geconfigureerd om de aandrijfsectie te besturen om het veerkrachtig materiaal

van een overzeteenheid boven een oppervlak van de eerste productdrager te positioneren, de aandrijfsectie te besturen om de afstand tussen de eerste productdrager en het veerkrachtig materiaal te verkleinen totdat het veerkrachtige materiaal wordt vervormd door een hoeveelheid gebakken deegstukken op het oppervlak van de eerste productdrager onder het veerkrachtige materiaal, de aandrijfsectie te besturen om het veerkrachtige materiaal te verplaatsen van de positie boven de eerste productdrager naar een positie boven de tweede productdrager en tegelijkertijd het overzetten van de hoeveelheid gebakken deegstukken van de eerste productdrager naar de tweede productdrager en de aandrijfsectie te besturen om het veerkrachtige materiaal te verplaatsen teneinde de afstand te vergroten tussen de tweede transportdrager en het veerkrachtig materiaal, teneinde de gebakken deegstukken vrij te geven op de tweede transportdrager (figures 1-2, page 3, lines 26-33 and 85-98; see assessment of claim 1 for details).

2.3 Moreover, also documents D2 (figures 1 and 5; page 1, line 102- page 2, line 28; page 2, lines 77-113), D3 (figures 1-4; page 2, lines 6-54) and D4 (figure 1; page 3) disclose all the technical features of claim 8

2.4 Hence, **claim 8** is not new in view of document D1 (or D2 or D3 or D4)

3 **Dependent claims 2, 7 and 14-15: Novelty**

Dependent **claims 2, 7 and 14-15** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of novelty, the reasons being as follows:

3.1 **Claim 2:** see D1 (page 3, lines 85-98)

3.2 **Claims 7 and 14:** see D1 (page 3, lines 85-98) or D2 (page 2, lines 77-109)

3.3 **Claim 15:** see D1 (figures 1-2; page 3), D2 (figures 1 and 5; page 1, line 102- page 2, line 28; page 2, lines 77-113), D3 (figures 1-4; page 2, lines 6-54) or D4 (figure 1; page 3)

4 **Dependent claims 3-6 and 9-13: Inventive step**

Dependent **claims 3-6 and 9-13** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of inventive step, the reasons being as follows:

4.1 **Claims 3-4 and 9-10:** it is merely a design option that the second product carrier is a tray or a trolley.

Hence, claims 3-4 and 9-10 are not inventive in view of documents D1 (or D2 or D3 or D4) and the customary practice of the skilled person.

4.2 Claims 5 and 11: see D1 (page 3, lines 85-98)

Hence, claims 5 and 11 are not inventive in view of documents D1 (or D2 or D3 or D4) and the customary practice of the skilled person.

4.3 Claims 6 and 13:

It is customary practice to provide corrugated product carriers in order to organize and align the stream of baked products (see e.g. D5 column 2, lines 41-45). As a result the skilled person has no other choice than to transfer the baked products along the length of the corrugations.

Hence, claims 6 and 13 are not inventive in view of documents D1 (or D2 or D3 or D4) and the customary practice of the skilled person.

4.4 Claim 12: see D2 ((4) figures 1 and 5; page 2, lines 86-97)

Hence, claim 12 is not inventive in view of document D2 and the customary practice of the skilled person.