

Description

BACKGROUND OF THE INVENTION

This invention generally relates to methods and apparatus for packaging food materials in the form of individually wrapped single slices; and more specifically, to such a method and apparatus having an improved arrangement for guiding a continuous strip of wrapped food material to a cutting assembly that cuts that continuous strip into individually wrapped single slices.

Various food materials, particularly cheeses, are sold in packages containing individually wrapped single slices of the food material, and various prior art methods and apparatuses are known for preparing food materials in this form. Typically, with these prior art arrangements, as exemplified in US-A-4015021, a food material is extruded into a continuous envelope or tube of wrapping film to form a wrapped food material, that wrapped food material is then flattened into a continuous strip, and this continuous strip is pressed at spaced intervals to express the food material from between those spaced intervals, thereby establishing wrapped food material slices of a predetermined length. The continuous strip of wrapped slices is then cut to produce individually wrapped slices of the food material.

GB-A-2179620 discloses an apparatus for manufacturing individually wrapped slices of processed cheese in which a hot mass of cooked cheese is extruded through a nozzle and a tube of sheet material is formed around it. The resulting filled tube is then fed into a gap between a pressure wheel and a vacuum wheel which are drivably connected to one another and to a cutter wheel. In passage through this gap the cheese in the tube is compressed to a thickness determined by the spacing between the pressure wheel and the vacuum wheel. In addition cooperating anvils in register on the pressure wheel and on the vacuum wheel squeeze back the cheese in the parts of the tube between the abutting anvils so that the cheese in the shaped tube emerging from between the two tubes is divided into equal portions with the parts of the tube between the portions of cheese pressed into flat webs. The shaped tube is held against the vacuum wheel by vacuum in apertures in the periphery of the vacuum wheel and the entrainment of the shaped tube to the vacuum wheel by the vacuum is said to provide the pull in the tube necessary for drawing the webs of sheet material through the tube former. The shaped tube passes between the vacuum wheel and the cutter wheel and the flat webs are again compressed between the anvils on the vacuum wheel and blade holders on the cutting wheel. Blades in the blade holders

sever the flat webs centrally across their full width so that the shaped tube is divided into sections each containing a portion of the hot cheese. Each section of tube containing the portion of cheese is held against the periphery of the vacuum wheel by the vacuum until the section of tube is above a belt conveyor.

While these prior art methods and apparatuses perform very satisfactorily, it is believed that they may be improved. For instance, in these prior art methods and apparatuses, typically the continuous strip of wrapped food material is loosely fed to the assembly that cuts that strip into the individual pieces. Because of this, the continuous strip is not always properly fed to the cutting assembly, particular upon the initial feeding of the strip to the cutting assembly. Also, the continuous strip of wrapped food material sometimes becomes blocked in its passage through the cutting assembly.

SUMMARY OF THE INVENTION

The present invention relates to a method and apparatus for producing a wrapped food material in single slice form. The apparatus comprises means to conduct the food material into a wrapping film to form a wrapped food material, slice forming means to press the wrapped food material at spaced intervals to form a continuous strip of connected, wrapped food material slices, and cutting means to cut that continuous strip at those spaced intervals to produce individually wrapped and sealed food material slices. The apparatus also includes means to guide the continuous strip of wrapped food material slices from the slice forming means to the cutting means along a predetermined path of travel. This guiding means, in turn, includes a stationary guide plate located between the slice forming means and the cutting means, and extending along said path of travel, and means to develop a partial vacuum between the continuous strip of wrapped food material slices and at least a portion of the guide plate to draw that strip thereagainst as the strip of connected slices passes to the cutting means.

Preferably, a venturi effect is used to develop the desired partial vacuum between the continuous strip of the wrapped food material and the guide plate. More specifically, this vacuum is developed by conducting a first stream of air laterally outward in a first direction from a given area of the guide plate and conducting a second stream of air laterally outward in a second direction from that same given area of the guide plate. These two air streams thus produce a partial vacuum between the continuous strip of wrapped food material slices and that given area of the guide plate.

Further benefits and advantages of the invention will become apparent from a consideration of the following detailed description given with reference to the accompanying drawings, which specify and show preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic, side elevation view of an apparatus embodying the present invention.

Figure 2 shows in greater detail a portion of the apparatus of Figure 1.

Figure 3 is a plan view of a guide plate used in the apparatus of Figure 1.

Figure 4 is a cross-sectional view taken along Line IV-IV of Figure 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 illustrates a preferred food processing apparatus 10 employing teachings of this invention. A food material 12, which may be fluid or semi-fluid, such as processed cheese or cheese foods, is placed into a hopper 14 and continuously fed to a nozzle 16 by means of a pump 20. The nozzle is inserted into a tube of wrapping film 22, which has been formed from a strip 24 mounted on a film holder 26, and a cooling assembly 30 is provided to cool the food material discharged from nozzle 16.

The tubular film 22 filled with the food material 12 is then fed between press rolls 32 that press the food material into a strip form 34 in which the food material is in intimate contact with the inner surface of the film. The rolls 32 serve not only to reduce the wrapped food material to a strip form but also to transport the formed strip. After leaving rolls 32, the food material strip 34 is then press molded to the desired shape by means of a molding device 36, which comprises a pair of moving belts 40 and 42 and a multitude of molding frames 44 mounted on each of those belts.

The inner runs of belts 40 and 42 are arranged in opposing relation to each other so that a pair of molding frames, one on belt 40 and one on belt 42, come into matching contact between the inner runs of the belts. Each of the molding frames has a projecting wall portion 46 that extends horizontally when the frame is moving vertically between the inner runs of the belt, and the outer most ends of the projecting wall portions of opposing molding frames come into matching contact between the inner runs of belts 40 and 42 to press strip 34 at regular, spaced intervals. This forms connecting sections 50 on strip 34 and also squeezes the food material out of those connecting sections to form slices of the food material.

Strip 34 then is conducted to cutting apparatus 52, which comprises anvil 54 and rotary cutter 56. The rotary cutter slices the strip 34 along connecting sections 50, producing individual slices of wrapped food material. These individually cut, wrapped food material single slices are fed, one after another, onto a delivery conveyor 62 and thereafter a stacking wheel (not shown) is used to stack the slices in a pile.

Guide plate 70 is located between assembly 36 and cutting assembly 52 to guide strip 34 into that latter assembly, and a partial vacuum is developed between the food material strip and at least a portion of plate 70 to draw that strip thereagainst as the strip of food material passes into the cutting assembly. In this way, plate 70 positively guides the strip 34 into cutting assembly 52, between anvil 54 and rotary knife 56, insuring that the strip of food material properly enters and passes smoothly through that cutting apparatus.

Any suitable means or system may be used to produce the desired partial vacuum between strip 34 and guide plate 70; however, preferably, a venturi effect is used to generate the desired vacuum. Even more preferably, this venturi effect is produced by directing first and second streams of air laterally outward in first and second opposite directions from a given area of guide plate 70, thereby producing a partial vacuum between food strip 34 and that given area of the guide plate.

As described above, apparatus 10 produces one strip 34 of food material. With modifications well within the ability of those of ordinary skill in the art, apparatus 10 may be constructed and operated to produce two or more such strips in parallel; and, indeed, the preferred embodiment of guide plate 70 described below in detail is designed to guide two parallel strips of food material from assembly 36 to cutting assembly 52.

Guide plate 70 is illustrated in greater detail in Figures 2-4; and with reference thereto, the guide plate preferably includes a base member 72 and a pair of discharge manifolds 74. Base member 72 defines a preferably planar guide surface 76 and a pair of grooves or recesses 80. These grooves extend inward from that guide surface, and in apparatus 10, grooves 80 extend along the direction of travel of food strip 34. Each discharge manifold 74 is positioned in a respective one groove 80 and forms a longitudinally extending conduit 82 and first and second series of transverse outlet openings 84 and 86. In use, high-pressure air is conducted into conduit 82, openings 84 conduct a first air stream, referenced at 90 in Figure 4, outward from conduit 82 and toward the first transverse side of plate 70, and openings 86 conduct a second air stream, referenced at 92 in Figure 4, outward from conduit 82 and toward the second transverse side

of the guide plate. These air streams produce the above-discussed venturi effect, which in turn produces a low pressure region, or partial vacuum, between food strip 34 and the portion of guide plate 70 between these air streams.

As illustrated in Figures 3 and 4, each discharge manifold 74 has a U-shaped transverse cross-section, and includes base portion 74a and first and second leg portions 74b and 74c, which extend outward from the transverse ends of base portion 74a, perpendicular thereto. Openings 84 are formed in leg portion 74b and preferably are equally spaced apart along the length of this leg portion; and similarly, openings 86 are formed in leg portion 74c and preferably are equally spaced apart along the length of this leg portion.

With particular reference to Figure 4, each groove 80 preferably is formed by a central surface portion 80a and a pair of lateral surface portions 80b and 80c. Each discharge manifold 82 is positioned immediately over the central surface portion of a respective one groove 80; and the lateral surface portions 80b and 80c of each groove extend laterally outwardly upwardly in first and second opposite directions, respectively, from the central surface portion of the groove to help guide the first and second air streams outward from the discharge manifold positioned in the groove.

Any suitable means may be used to conduct air to guide plate 70, and in particular, into conduits 82 thereof. For example, with the arrangement shown in Figure 1, a hose or air line 94 is used to conduct pressurized air from a source thereof 96 and into one end of each conduit 82. Alternatively, for example, openings (not shown) may be formed through base member 72 extending outward from and in fluid communication with each conduit 82, and a hose or air line may be secured in each of these openings to conduct pressurized air from a source thereof and into conduits 82, between the longitudinal ends thereof.

Preferably, control means are provided to control the volume of air in the air streams 90 and 92, and this may be done by controlling the amount of air supplied to conduits 82. With the embodiment of apparatus 10 shown in Figure 1, this control means includes a valve 98 disposed in line 94 and which is operated, either manually or automatically, to adjust the volume of air conducted through line 94 and, thereby, to adjust the venturi effect produced by air streams 90 and 92.

Guide plate 70 has a generally flat, thin shape, although preferably the top and bottom ends of the plate are slanted, as shown in Figure 2, to facilitate positioning that plate between assemblies 36 and 52. Plate 70 may be made of any suitable material, such as steel. Preferably, however, plate 70, or at least surface 76 thereof, is comprised of chromium

or a chromium alloy to reduce the friction between the guide plate and food strip 34. The guide plate 70 may be supported in assembly 10 in any acceptable manner; and for example, this plate may be connected to and supported by cutting assembly 52. Also, manifold members 74 may be secured to base member 72 in any suitable manner. For example, a suitable friction fit may be developed between manifold member and base member to hold the manifold member in place in one of the grooves 80. Alternatively, for example, the manifold members may be bolted or welded to the base member.

Hopper 14, nozzle 16, pump 20, film 24, sealing assembly 30, rolls 32, molding assembly 36, and cutting assembly 52 may all be comprised of standard or known items in the art, and it is unnecessary to describe these elements of apparatus 10 herein in detail. Further, each molding frame 44 may be provided with a press plate (not shown) of the type known in the art to press against the top surface of the food material in strip 34 to produce slices having a uniform thickness and an exact shape.

In addition, various items may be added to apparatus 10 without departing from the scope of the present invention; and in particular, additional cooling means, heating means, or both may be added at various locations in apparatus 10 to control the temperature of the wrapped food material moving therethrough. Further, the embodiment of apparatus 10 shown in Figure 1 uses a nozzle 16 having a circular shaped outlet. Instead of using such a nozzle, apparatus 10 may be provided with a nozzle having a narrow, slit-shaped outlet; and when such a nozzle is used, it may be unnecessary to use press rolls 32 to flatten the food material discharged from the nozzle. In addition, apparatus 10 may be provided with a sealing assembly to form a sealed seam on the wrapping film after that film has been filled with food material. Also, other cutting devices may be used in apparatus 10; and, for example, this apparatus may be provided with a rotary heat cutter that cuts connecting sections 50 of strip 34 by melting those areas of the food strip.

Claims

1. Apparatus (10) for producing a wrapped food material in single slice form, comprising:
 - means (14, 16, 20) to conduct the food material (12) into a wrapping film (22) to form a wrapped food material;
 - slice forming means (36) to press the wrapped food material at spaced intervals to form a continuous strip (34) of connected, wrapped food material slices;



of the guide plate. These air streams produce the above-discussed venturi effect, which in turn produces a low pressure region, or partial vacuum, between food strip 34 and the portion of guide plate 70 between these air streams.

As illustrated in Figures 3 and 4, each discharge manifold 74 has a U-shaped transverse cross-section, and includes base portion 74a and first and second leg portions 74b and 74c, which extend outward from the transverse ends of base portion 74a, perpendicular thereto. Openings 84 are formed in leg portion 74b and preferably are equally spaced apart along the length of this leg portion; and similarly, openings 86 are formed in leg portion 74c and preferably are equally spaced apart along the length of this leg portion.

With particular reference to Figure 4, each groove 80 preferably is formed by a central surface portion 80a and a pair of lateral surface portions 80b and 80c. Each discharge manifold 82 is positioned immediately over the central surface portion of a respective one groove 80; and the lateral surface portions 80b and 80c of each groove extend laterally outwardly upwardly in first and second opposite directions, respectively, from the central surface portion of the groove to help guide the first and second air streams outward from the discharge manifold positioned in the groove.

Any suitable means may be used to conduct air to guide plate 70, and in particular, into conduits 82 thereof. For example, with the arrangement shown in Figure 1, a hose or air line 94 is used to conduct pressurized air from a source thereof 96 and into one end of each conduit 82. Alternatively, for example, openings (not shown) may be formed through base member 72 extending outward from and in fluid communication with each conduit 82, and a hose or air line may be secured in each of these openings to conduct pressurized air from a source thereof and into conduits 82, between the longitudinal ends thereof.

Preferably, control means are provided to control the volume of air in the air streams 90 and 92, and this may be done by controlling the amount of air supplied to conduits 82. With the embodiment of apparatus 10 shown in Figure 1, this control means includes a valve 98 disposed in line 94 and which is operated, either manually or automatically, to adjust the volume of air conducted through line 94 and, thereby, to adjust the venturi effect produced by air streams 90 and 92.

Guide plate 70 has a generally flat, thin shape, although preferably the top and bottom ends of the plate are slanted, as shown in Figure 2, to facilitate positioning that plate between assemblies 36 and 52. Plate 70 may be made of any suitable material, such as steel. Preferably, however, plate 70, or at least surface 76 thereof, is comprised of chromium

or a chromium alloy to reduce the friction between the guide plate and food strip 34. The guide plate 70 may be supported in assembly 10 in any acceptable manner; and for example, this plate may be connected to and supported by cutting assembly 52. Also, manifold members 74 may be secured to base member 72 in any suitable manner. For example, a suitable friction fit may be developed between manifold member and base member to hold the manifold member in place in one of the grooves 80. Alternatively, for example, the manifold members may be bolted or welded to the base member.

Hopper 14, nozzle 16, pump 20, film 24, sealing assembly 30, rolls 32, molding assembly 36, and cutting assembly 52 may all be comprised of standard or known items in the art, and it is unnecessary to describe these elements of apparatus 10 herein in detail. Further, each molding frame 44 may be provided with a press plate (not shown) of the type known in the art to press against the top surface of the food material in strip 34 to produce slices having a uniform thickness and an exact shape.

In addition, various items may be added to apparatus 10 without departing from the scope of the present invention; and in particular, additional cooling means, heating means, or both may be added at various locations in apparatus 10 to control the temperature of the wrapped food material moving therethrough. Further, the embodiment of apparatus 10 shown in Figure 1 uses a nozzle 16 having a circular shaped outlet. Instead of using such a nozzle, apparatus 10 may be provided with a nozzle having a narrow, slit-shaped outlet; and when such a nozzle is used, it may be unnecessary to use press rolls 32 to flatten the food material discharged from the nozzle. In addition, apparatus 10 may be provided with a sealing assembly to form a sealed seam on the wrapping film after that film has been filled with food material. Also, other cutting devices may be used in apparatus 10; and, for example, this apparatus may be provided with a rotary heat cutter that cuts connecting sections 50 of strip 34 by melting those areas of the food strip.

Claims

1. Apparatus (10) for producing a wrapped food material in single slice form, comprising:
means (14, 16, 20) to conduct the food material (12) into a wrapping film (22) to form a wrapped food material;
slice forming means (36) to press the wrapped food material at spaced intervals to form a continuous strip (34) of connected, wrapped food material slices;



- cutting means (54) to cut said continuous strip (34) at said spaced intervals to produce individually wrapped and sealed food material slices; and
- means to guide said continuous strip (34) from the slice forming means (36) to the cutting means (52) along a predetermined path of travel, and including
- i) a stationary guide plate (70) located between the slice forming means (36) and the cutting means (52), and extending along said path of travel, and
 - ii) means (74) connected to the plate (70) to develop a partial vacuum between said continuous strip and at least a portion of the guide plate (70) to draw said strip (34) thereagainst as the strip (34) of connected slices passes to the cutting means (52).
2. Apparatus according to claim 1, wherein:
- the guide plate (70) has first and second opposite transverse sides, defines a guide surface (76) and includes
- i) a base member (72) forming a groove (80) extending inward from the guide surface (76), and
 - ii) means (74) located in the groove (80) to conduct a first stream of air (90) laterally outward from said groove (80) and towards the first transverse side of the guide plate (70), and to conduct a second stream of air (92) laterally outward from the groove (80) and towards the second transverse side of the guide plate (70),
- wherein said first and second streams of air (90, 92) produce a partial vacuum between a portion of the guide surface (76) and the continuous strip (34) of wrapped food material slices; and
- the means (74) to develop a partial vacuum includes means (94) to conduct pressurized air to said groove (80) from a source (96) of pressurized air.
3. Apparatus according to claim 2, wherein:
- the means (74) to conduct the first and second streams of air (90, 92) outward from said groove includes a discharge manifold (74) located in the groove (80); and
- the discharge manifold (74) defines
- i) a conduit (82) for receiving the pressurized air,
 - ii) a first series of openings (84) to conduct pressurized air outward from said conduit and towards the first transverse side of the guide plate (70), and
 - iii) a second series of openings (86) to conduct pressurized air outward from said conduit (82) and towards the second transverse side of the guide plate (70).
4. Apparatus according to claim 3, wherein:
- the discharge manifold (74) includes
- i) a base portion (74a),
 - ii) a first leg portion (74b) connected to and extending from the base portion (74a), and
 - iii) a second leg portion (74c) connected to and extending from the base portion (74a); and
- the first series of openings (84) are formed in the first leg portion (74b) of the discharge manifold (74), and the second series of openings (86) are formed in the second leg portion (74c) of the discharge manifold (74).
5. Apparatus according to claim 4, wherein
- the base member (72) of the guide plate (70) includes a central surface section (80a) spaced inward from the guide surface (76);
- the manifold (74) extends over said central surface section (80a);
- the base member (72) of the guide plate (70) further includes
- i) a first lateral surface portion (80b) extending laterally outwardly upwardly from the central surface section (80a) to guide the first air stream (90) outward from the first series of openings (84), and
 - ii) a second lateral surface portion (80c) extending laterally outwardly upwardly from the central surface section (80a) to guide the second air stream (92) outward from the second series of openings (86).
6. Apparatus according to any one of claims 3 to 5, wherein the means to conduct pressurized air to said groove includes a fluid line (94) to conduct pressurized air into the conduit (82) of the discharge manifold (74) from the source of pressurized air (96).
7. Apparatus according to claim 6, wherein the means to develop the partial vacuum further includes valve means (98) connected to the fluid line (94) to control the volume of air conducted therethrough.
8. A guide plate (70) for guiding a continuous strip (34) of wrapped food material moving past the guide plate (76), comprising:
- a base member (72) having first and second opposite lateral sides, and defining a guide surface (76) and a groove (80) extending inward therefrom; and
- a discharge manifold (74) positioned in said groove and defining



- i) an air conduit (82) for receiving a supply of air,
 ii) a first series of outlet openings (84) to conduct a first stream of air (90) outward from said conduit (82) and toward the first lateral side of the base member (72), and
 iii) a second series of outlet openings (86) to conduct a second stream of air (92) outward from said conduit (74) and toward the second lateral side of the base member,
 wherein the first and second air streams (90, 92) produce a low pressure region immediately over the discharge manifold (74) to draw the continuous strip (34) of food material against the guide plate (70).
9. A guide plate according to claim 8, wherein:
 the base member (72) of the guide plate includes a central surface section (80a) spaced inward from the guide surface;
 the discharge manifold (74) extends over said central surface section (80a); and
 the base member (72) of the guide plate (70) further includes
 i) a first lateral surface portion (80b) extending laterally outwardly upwardly from the central surface section (80a) toward the first lateral side of the base member (72) to guide the first air stream (90) outward from the first series of openings (84), and
 ii) a second lateral surface portion (80c) extending laterally outwardly upwardly from the central surface section (80a) toward the second lateral side of the base member (72) to guide the second air stream (92) outward from the second series of openings (86).
10. A guide plate according to claim 9, wherein:
 the discharge manifold (74) includes
 i) a base portion (74a),
 ii) a first leg portion (74b) connected to and extending from the base portion (74a), and
 iii) a second leg portion (74c) connected to and extending from the base portion (74a);
 the first series of openings (84) are formed in the first leg portion (74b) of the discharge manifold (74), and the second series of openings (86) are formed in the second leg portion (74c) of the discharge manifold (74).
11. A guide plate according to claim 10, wherein:
 said guide surface (76) is substantially planar; and
 the base portion (74a) of the discharge manifold (74) defines an outside surface substantially co-planar with the guide surface (76).
12. A method for producing a wrapped food material (12) in single slice form, comprising:
 conducting the food material (12) into a wrapping film (22) to form a wrapped food material;
 pressing the wrapped food material at spaced intervals to form a continuous strip (34) of connected, wrapped food material slices;
 conducting said continuous strip (34) along a predetermined path of travel to a cutting apparatus (52), including
 i) conducting the continuous strip (34) past a stationary guide plate (70) extending along said path of travel, and
 ii) developing a partial vacuum between the continuous strip (34) and the guide plate (70) to draw the continuous strip (34) thereagainst; and
 using the cutting apparatus (52) to cut the continuous strip (34) at said spaced intervals to produce individually wrapped food material slices.
13. A method according to claim 12, wherein the developing step includes the steps of:
 conducting a first stream of air (90) laterally outward in a first direction from a given area of the guide plate (70); and
 conducting a second stream of air (92) laterally outward in a second direction from said given area of the guide plate (70);
 wherein said first and second streams of air (90, 92) produce a partial vacuum between the continuous strip (34) of food material slices and said given area of the guide plate (70).
14. A method according to claim 13 or claim 14, wherein the developing step further includes the step of controlling the volume of air in said first and second streams (90, 92).
15. A method according to claim 13 or claim 14, wherein the guide plate (70) includes a body member (72) and a manifold (74) connected to the body member (72), and wherein:
 the developing step further includes the step of conducting a supply of air from a source (96) thereof to the manifold (74);
 the step of conducting the first stream of air (90) includes the step of discharging the first stream of air (90) laterally outward from a first side of the manifold (74); and
 the step of conducting the second stream of air (92) includes the step of discharging the second stream of air (92) laterally outward from a second side of the manifold (74).

**Patentansprüche**

1. Vorrichtung zum Herstellen eines verpackten Lebensmittels in Form einzelner Scheiben mit einer Vorrichtung (14, 16, 20) zum Einleiten eines Lebensmittels (12) in eine Verpackungsfolie (22),
einer Scheibenformvorrichtung (36), um das verpackte Lebensmittelmaterial in bestimmten Abständen zu einem fortlaufenden Streifen (34) von miteinander verbundenen, verpackten Lebensmittelscheiben zu pressen,
einer Schneidvorrichtung (52), um den fortlaufenden Streifen (34) in bestimmte Unterteilungen zu schneiden, um einzeln verpackte und versiegelte Lebensmittelmaterialscheiben zu erzielen, und
einer Vorrichtung zum Führen des fortlaufenden Streifens (34) von der Scheibenformvorrichtung (36) zur Schneidvorrichtung (52) längs seines vorbestimmten Transportweges sowie ferner mit
i) einer stationären Führungsplatte (70), die zwischen der Scheibenformvorrichtung (36) und der Schneidvorrichtung (52) liegt und sich längs des Transportweges erstreckt und mit einer
ii) Vorrichtung (74), die mit der Führungsplatte (70) verbunden ist, um zwischen dem fortlaufenden Streifen und wenigstens einem Teil der Führungsplatte (70) ein Teilvakuum zu entwickeln, um den Streifen (34) dann anzuziehen, wenn dieser Streifen (34) von miteinander verbundenen Scheiben an der Schneidvorrichtung (52) vorbeiläuft.
2. Vorrichtung nach Anspruch 1, wobei die Führungsplatte (70) erste und zweite, einander gegenüberliegende, quer verlaufende Seiten hat und eine Führungsfläche (76) bildet und ferner folgende Teile umfaßt:
i) ein Basisteil (72), das eine Nut (80) bildet, die sich von der Führungsfläche (76) aus nach innen erstreckt, und
ii) eine Vorrichtung (74), die in der Nut (80) liegt, um einen ersten Luftstrom (90) seitlich aus der Nut (80) heraus und in Richtung auf die erste, quer verlaufende Seite der Führungsplatte (70) zu leiten und ferner einen zweiten Luftstrom (92) seitlich aus der Nut (80) heraus und in Richtung auf die zweite quer verlaufende Seite der Führungsplatte (70),
wobei der erste und zweite Luftstrom (90, 92) zwischen einem Teil der Führungsfläche (76) und dem fortlaufenden Streifen (34) verpackter Lebensmittelscheiben ein Teilvakuum erzeugt; und

wobei die Vorrichtung (74) zum Erzeugen eines Teilvakuums eine Einrichtung (94) enthält, mit deren Hilfe der Nut (80) Druckluft aus einer Druckluftquelle (96) zugeleitet werden kann.

3. Vorrichtung nach Anspruch 2, wobei die Vorrichtung (74) zum Führen des ersten und zweiten Luftstromes (90, 92) aus der Nut heraus einen Auslaßverteiler (74) hat, der in der Nut liegt, wobei dieser Auslaßverteiler (74) folgende Teile hat:
i) eine Leitung (82) zum Aufnehmen der Druckluft,
ii) eine erste Serie von Öffnungen (84), um die Druckluft aus der Leitung (82) nach außen und in Richtung auf die erste quer verlaufende Seite der Führungsplatte (70) zu richten und
iii) eine zweite Serie von Öffnungen (86), um die Druckluft aus der Leitung (82) nach außen und in Richtung auf die zweite, quer verlaufende Seite der Führungsplatte (70) zu leiten.
4. Vorrichtung nach Anspruch 3, wobei der Auslaßverteiler (74) folgende Teile aufweist:
i) einen Basisteil (74a),
ii) einen ersten Schenkelteil (74b), der mit dem Basisteil (74a) verbunden ist und sich von ihm wegerstreckt,
iii) einen zweiten Schenkelteil (74c), der mit dem Basisteil (74a) verbunden ist und sich von ihm wegerstreckt, wobei die erste Serie von Öffnungen (84) im ersten Schenkelteil (74b) des Auslaßverteilers (74) eingeformt ist und wobei die zweite Serie von Öffnungen (86) in dem zweiten Schenkelteil (74c) des Auslaßverteilers (74) eingeformt ist.
5. Vorrichtung nach Anspruch 4, wobei das Basisteil (72) der Führungsplatte (70) einen zentralen Flächenteil (80a) hat, der von der Führungsfläche (76) aus gesehen weiter innen liegt;
der Auslaßverteiler (74) sich über den zentralen Flächenabschnitt (80a) erstreckt und das Basisteil (72) der Führungsplatte (70) folgende Teile aufweist:
i) einen ersten, seitlichen Flächenabschnitt (80b), der sich von dem zentralen Flächenabschnitt (80a) aus seitlich nach außen und oben erstreckt, um den ersten Luftstrom (90) aus der ersten Serie von Öffnungen (84) heraus nach außen zu leiten und
ii) einen zweiten, seitlichen Flächenabschnitt (80c), der sich vom zentralen Flächenabschnitt (80a) aus seitlich nach außen und oben erstreckt, um den zweiten Luftstrom



(92) aus der zweiten Serie von Öffnungen (86) nach außen zu leiten.

Vorrichtung nach einem der Ansprüche 3 bis 5, wobei die Vorrichtung zum Zuführen der Druckluft zur Nut eine Fluidleitung (94) aufweist, mit deren Hilfe Druckluft aus einer Druckluftquelle (96) in den Auslaßverteiler (74) eingeleitet werden kann.

7. Vorrichtung nach Anspruch 6, wobei die Vorrichtung zum Entwickeln des Teilvakuums ferner eine Ventilvorrichtung (98) aufweist, die mit der Fluidleitung in Verbindung steht, um das durch diese Leitung zugeführte Luftvolumen zu steuern.

8. Führungsplatte (70) zum Führen eines fortlaufenden Streifens (34) aus verpacktem Lebensmittelmaterial, das an der Führungsplatte (70, 76) vorbeibewegt wird, wobei die Führungsplatte folgende Teile aufweist:

ein Basisteil (72), das erste und zweite, einander gegenüberliegende Seiten hat und eine Führungsfläche (76) bildet, sowie eine Nut (80), die sich innerhalb der Führungsfläche erstreckt und einen Auslaßverteiler (74), der in der Nut angeordnet ist und

i) eine Luftleitung (82) zum Aufnehmen zugeführter Luft bildet sowie

ii) eine erste Serie von Auslaßöffnungen (84) hat, um einen ersten Luftstrom (90) aus der Leitung (82) heraus nach außen und in Richtung der ersten Seite des Basisteils (72) zu leiten und ferner

iii) eine zweite Serie von Auslaßöffnungen (86), um einen zweiten Luftstrom (92) aus der Leitung (82) heraus und in Richtung auf die zweite Seite des Basisteils zu leiten,

wobei die ersten und zweiten Luftströme (90, 92) unmittelbar oberhalb des Auslaßverteilers (74) einen Bereich niedrigen Druckes erzeugen, um den fortlaufenden Streifen (34) aus Lebensmittelmaterial gegen die Führungsplatte (70) zu ziehen.

9. Führungsplatte nach Anspruch 8, wobei das Basisteil (72) der Führungsplatte einen zentralen Flächenabschnitt (80a) hat, der von der Führungsfläche aus einen Abstand nach innen aufweist,

sich der Auslaßverteiler (74) über dem zentralen Flächenabschnitt (80a) erstreckt, und das Basisteil (72) der Führungsplatte (70) ferner folgende Teile aufweist:

i) einen ersten, seitlichen Flächenabschnitt (80b), der sich vom zentralen Flächenab-

schnitt (80a) aus in Richtung auf die erste Seite des Basisteils (72) seitlich nach außen und oben erstreckt, um den ersten Luftstrom (90) aus der ersten Serie von Öffnungen (84) nach außen zu leiten und

ii) einen zweiten, seitlichen Flächenabschnitt (80c), der sich vom zentralen Flächenabschnitt (80a) aus in Richtung auf die zweite Seite des Basisteils (72) seitlich nach oben und außen erstreckt, um den zweiten Luftstrom (92) aus der zweiten Serie von Öffnungen (86) nach außen zu leiten.

10. Führungsplatte nach Anspruch 9, wobei der Auslaßverteiler (74) folgende Teile umfaßt:

i) einen Basisteil (74a),

ii) einen ersten Schenkelteil (74b), der mit dem Basisteil (74a) verbunden ist und sich von ihm wegerstreckt, und

iii) einen zweiten Schenkelteil (74c), der mit dem Basisteil (74a) verbunden ist und sich von ihm wegerstreckt;

wobei die erste Serie von Öffnungen (84) im ersten Schenkelteil (74b) des Auslaßverteilers (74) eingeformt sind und wobei die zweite Serie von Öffnungen (86) in dem zweiten Schenkelteil (74c) des Auslaßverteilers (74) eingeformt sind.

11. Führungsplatte nach Anspruch 10, wobei die Führungsfläche (76) im wesentlichen eben ist und

wobei der Basisteil (74a) eine Außenseite bildet, die mit der Führungsfläche (76) im wesentlichen koplanar ist.

12. Verfahren zum Erzeugen eines verpackten Lebensmittels (12) in Form einzelner Scheiben mit folgenden Verfahrensschritten:

Zuleiten des Lebensmittelmaterials (12) in eine Verpackungsfolie (22), um ein verpacktes Lebensmittel zu bilden;

Zusammendrücken des verpackten Lebensmittelmaterials in bestimmten Abständen, um einen fortlaufenden Streifen (34) von verbundenen, verpackten Lebensmittelmaterialscheiben zu bilden;

Zuführen des fortlaufenden Streifens (34) längs eines vorbestimmten Transportweges zu einer Schneidvorrichtung (52), wobei dieser Schritt folgende Unterschritte aufweist:

i) Vorbeiführen des fortlaufenden Streifens (34) an einer stationären Führungsplatte (70), die sich längs des Transportweges erstreckt und

ii) Entwickeln eines Teilvakuums zwischen dem fortlaufenden Streifen (34) und der Führungsplatte (70), um den fortlaufenden



- Streifen (34) gegen die Platte anzuziehen;
und
iii) Verwenden der Schneidvorrichtung (52)
dazu, den fortlaufenden Streifen (34) an be-
stimmten, im Abstand voneinander angeord-
neten Stellen zu durchschneiden, um ein-
zeln verpackte Lebensmittelmaterialschei-
ben zu erzeugen.
13. Verfahren nach Anspruch 12, wobei der Schritt
zum Erzeugen des Teilvakuums folgende Un-
terschritte aufweist:
Führen eines ersten Luftstromes (90) seitlich
auswärts in einer ersten Richtung aus einem
gegebenen Bereich der Führungsplatte (70)
und
Führen eines zweiten Luftstromes (92) seitlich
auswärts in einer zweiten Richtung aus dem
gegebenen Bereich der Führungsplatte (70);
wobei die ersten und zweiten Luftströme (90,
92) zwischen dem fortlaufenden Streifen (34)
aus Lebensmittelmaterialscheiben und dem
gegebenen Bereich der Führungsplatte (70)
ein Teilvakuum erzeugen.
14. Verfahren nach einem der Ansprüche 13 oder
14, wobei der Schritt zum Entwickeln des Teil-
vakuums ferner den Schritt des Steuerns des
Luftvolumens in den ersten und zweiten Luft-
strömen (90, 92) umfaßt.
15. Verfahren nach einem der Ansprüche 13 oder
14, wobei die Führungsplatte (70) ein Basisteil
(72) und einen Auslaßverteiler (74) umfaßt, der
mit dem Basisteil (72) verbunden ist, wobei
der Schritt zum Entwickeln des Teilvakuums
ferner den Schritt des Zuleitens von Luft aus
einer Druckluftquelle (96) zum Auslaßverteiler
(74) umfaßt; und
wobei der Schritt des Führens des ersten Luft-
stromes (90) den Schritt des Auslassens die-
ses ersten Luftstromes (90) seitlich aus der
ersten Seite des Auslaßverteilers (74) umfaßt
und
daß der Schritt des Leitens des zweiten Luft-
stromes (92) den Schritt des Auslassens die-
ses zweiten Luftstromes (92) seitlich aus der
zweiten Seite des Auslaßverteilers (74) umfaßt.

Revendications

1. Dispositif (10) pour produire une denrée ali-
mentaire emballée sous forme d'une tranche,
comprenant :
des moyens (14, 16, 20) pour diriger la
denrée alimentaire (12) dans un film d'emballe-
ge (22) afin de former une denrée alimentaire
emballée;

un moyen de formation de tranche (36)
pour presser la denrée alimentaire emballée à
des intervalles espacés, afin de former une
bande continue (34) de tranches de denrée
alimentaire emballées, reliées;

un moyen de coupe (54) pour couper ladi-
te bande continue (34) auxdits intervalles espa-
cés, afin de produire des tranches de denrée
alimentaire emballées et scellées individuelle-
ment; et

un moyen pour guider ladite bande conti-
nue (34) depuis le moyen de formation de
tranche (36) vers le moyen de coupe (52), le
long d'un chemin de déplacement prédétermi-
né, et comprenant

i) une plaque de guidage (70) stationnaire
située entre le moyen de formation de tran-
che (36) et le moyen de coupe (52), et
s'étendant le long dudit chemin de déplace-
ment, et

ii) un moyen (74) connecté à la plaque (70)
pour développer un vide partiel entre ladite
bande continue et au moins une partie de
plaque de guidage (70), afin de tirer contre
lui ladite bande (34), lorsque la bande (34)
de tranches connectées arrive au moyen de
coupe (52).

2. Dispositif selon la revendication 1, dans lequel
: la plaque de guidage (70) a des première et
deuxième faces transversales opposées, définit
une surface de guidage (76) et comprend

i) un organe de base (72) formant une gor-
ge (80) s'étendant vers l'intérieur depuis la
surface de guidage (76), et

ii) un moyen (74) situé dans la gorge (80)
pour diriger un premier courant d'air (90)
latéralement vers l'extérieur depuis ladite
gorge (80) et vers la première face transver-
sale de la plaque de guidage (70), et pour
diriger un deuxième courant d'air (92) laté-
ralement vers l'extérieur depuis la gorge
(80) et vers la deuxième face transversale
de la plaque de guidage (70),

dans lequel lesdites premier et deuxième
courants d'air (90, 92) produisent un vide par-
tiel entre une partie de la surface de guidage
(76) et la bande continue (34) de tranches de
denrée alimentaire emballées, et

le moyen (74) pour développer un vide
partiel comprend un moyen (94) pour diriger
de l'air comprimé sur ladite gorge (81) depuis
une source (96) d'air comprimé.

3. Dispositif selon la revendication 2, dans lequel
:

le moyen (74) pour diriger les premier et
deuxième courants d'air (90, 92) vers l'exté-



rieur depuis ladite gorge comprend un collecteur d'évacuation (74) situé dans la gorge (80); et

le collecteur d'évacuation (74) définit

- i) une conduite (82) pour recevoir l'air comprimé,
- ii) une première série d'ouvertures (84) pour diriger de l'air comprimé vers l'extérieur du dit conduit et vers la première face transversale de la plaque de guidage (70), et
- iii) une deuxième série d'ouvertures (86) pour diriger de l'air comprimé vers l'extérieur de ladite conduite (82) et vers la deuxième face transversale de la plaque de guidage (70).

4. Dispositif selon la revendication 3, dans lequel : le collecteur d'évacuation (74) comprend

- i) une partie de base (74a),
- ii) une première partie de jambage (74b) connectée à et s'étendant depuis la partie de base (74a), et
- iii) une deuxième partie de jambage (74c) connectée à et s'étendant depuis la partie de base (74a); et

la première série d'ouvertures (84) est formée dans la première partie de jambage (74b) du collecteur d'évacuation (74) et la deuxième série d'ouvertures (86) est formée dans la deuxième partie de jambage (74c) du collecteur d'évacuation (74).

5. Dispositif selon la revendication 4, dans lequel :

l'organe de base (72) de la plaque de guidage (70) comprend une section de surface (80a) centrale espacée vers l'intérieur de la surface de guidage (76);

le collecteur (74) s'étend sur ladite section de surface (80a) centrale;

l'organe de base (72) de la plaque de guidage (70) comprend en outre

- i) une première partie de surface (82) latérale s'étendant latéralement vers l'extérieur, vers le haut depuis la section de surface centrale (80a), pour guider le premier courant d'air (90) vers l'extérieur de la première série d'ouvertures (84), et
- ii) une deuxième partie de surface (80c) latérale s'étendant latéralement vers l'extérieur, vers le haut depuis la section de surface centrale (80a), pour guider le deuxième courant d'air (92) vers l'extérieur depuis la deuxième série d'ouvertures (86).

6. Dispositif selon l'une quelconque des revendications 1 à 5, dans lequel le moyen pour diriger de l'air comprimé sur ladite gorge com-

prend une conduite hydraulique (94) pour diriger de l'air comprimé dans la conduite (82) du collecteur d'évacuation (74), depuis la source d'air comprimé (96).

7. Dispositif selon la revendication 6, dans lequel le moyen pour développer le vide partiel comprend en outre un moyen formant clapet (98) connecté à la conduite hydraulique (94) pour commander le volume d'air y étant dirigé.

8. Plaque de guidage (70) pour guider une bande continue (34) de denrée alimentaire emballée, se déplaçant au-delà de la plaque de guidage (76), comprenant :

un organe de base (72) ayant des première et deuxième faces latérales opposées et définissant une surface de guidage (76) et une gorge (80) s'étendant vers l'intérieur de cette dernière; et

un collecteur d'évacuation (74) disposé dans ladite gorge et définissant

- i) une conduite d'air (82) pour recevoir une amenée d'air,
- ii) une première série d'ouvertures de sortie (84) pour diriger un premier courant d'air (90) vers l'extérieur de ladite conduite (82) et vers la première face latérale de l'organe de base (72), et
- iii) une deuxième série d'ouvertures de sortie (86) pour diriger un deuxième courant d'air (92) vers l'extérieur de ladite conduite (74) et vers la deuxième face latérale de l'organe de base,

dans laquelle les premier et deuxième courants d'air (90, 92) produisent une zone à faible pression immédiatement au-dessus du collecteur d'évacuation (74), pour tirer la bande continue (34) de denrée alimentaire contre la plaque de guidage (70).

9. Plaque de guidage selon la revendication 8, dans laquelle :

l'organe de base (72) de la plaque de guidage comprend une section de surface centrale (80a) espacée vers l'intérieur depuis la surface de guidage;

le collecteur d'évacuation (74) s'étend sur ladite section de surface centrale (80a); et

l'organe de base (72) de la plaque de guidage (70) comprend en outre

- i) une première partie de surface latérale (80b) s'étendant latéralement vers l'extérieur, vers le haut depuis la section de surface centrale (80a), vers la première face latérale de l'organe de base (72), pour guider le premier courant d'air (90) vers l'extérieur depuis la série d'ouvertures (84), et



ii) une deuxième partie de surface latérale (86) s'étendant latéralement vers l'extérieur, vers le haut depuis la section de surface centrale (80a), vers la deuxième face latérale de l'organe de base (72), pour guider le deuxième courant d'air (92) vers l'extérieur depuis la deuxième série d'ouvertures (90).

10. Plaque de guidage selon la revendication 9, dans laquelle :

le collecteur d'évacuation (74) comprend

- i) une partie de base (74a),
- ii) une première partie de jambage (74b) connectée à et s'étendant depuis la partie de base (74a), et
- iii) une deuxième partie de jambage (74c) connectée à et s'étendant depuis la partie de base (74a);

la première série d'ouvertures (84) est formée dans la première partie de jambage (74b) du collecteur d'évacuation (74) et la deuxième série d'ouvertures (86) est formée dans la deuxième partie de jambage (74c) du collecteur d'évacuation (74).

11. Plaque de guidage selon la revendication 9, dans laquelle :

ladite surface de guidage (76) est sensiblement planaire; et

la partie de base (74a) du collecteur d'évacuation (74) définit une surface extérieure sensiblement coplanaire par rapport à la surface de guidage (76).

12. Procédé de production d'une denrée alimentaire (12) emballée sous forme d'une tranche, comprenant :

l'amenée de la denrée alimentaire (12) dans un film d'emballage (22), pour former une denrée alimentaire emballée;

le pressage de la denrée alimentaire emballée à des intervalles espacés pour former une bande continue (34) de tranches de denrée alimentaire emballées, reliées;

l'amenée de ladite bande continue (34) le long d'un chemin de déplacement prédéterminé à un dispositif de coupe (52), comprenant :

i) l'amenée de la bande continue (34) au-delà d'une plaque de guidage (70) stationnaire, s'étendant le long dudit chemin de déplacement, et

ii) le développement d'un vide partiel entre la bande continue (34) et la plaque de guidage (70) pour tirer contre elles la bande continue (34); et

l'utilisation du dispositif de coupe (52) pour couper la bande continue (34) auxdits intervalles espacés, afin de produire des tranches de

denrée alimentaire individuellement emballées.

13. Procédé selon la revendication 12, dans lequel l'étape de développement comprend les étapes dans lesquelles :

on dirige un premier courant d'air (90) latéralement vers l'extérieur, dans une première direction depuis une zone donnée de la plaque de guidage (70); et

on amène un deuxième courant d'air (92) latéralement vers l'extérieur, dans une deuxième direction depuis ladite zone donnée de la plaque de guidage (70);

dans lequel lesdits premier et deuxième courants d'air (90, 92) produisent un vide partiel entre la bande continue (34) de tranches de denrée alimentaire et ladite zone donnée de la plaque de guidage (70).

14. Procédé selon la revendication 13 ou 14, dans lequel l'étape de développement comprend en outre l'étape de commande du volume d'air desdits premier et deuxième courants (90, 92).

15. Procédé selon la revendication 13 ou la revendication 14, dans lequel la plaque de guidage (70) comprend un organe formant corps (72) et un collecteur (74) connecté à l'organe formant corps (72), et dans lequel :

l'étape de développement comprend en outre l'étape de guidage d'une amenée d'air provenant d'une source d'air (96) vers le collecteur (74);

l'étape de guidage du premier courant d'air (90) comprend l'étape d'évacuation du premier courant d'air (90) latéralement vers l'extérieur d'une première face du collecteur (74); et

l'étape de guidage du deuxième courant d'air (92) comprend l'étape d'évacuation du deuxième courant d'air (92) latéralement vers l'extérieur d'une deuxième face du collecteur (74).