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54 **Method and system for forming sleeved containers.**

57 The invention relates to a system and method for forming sleeved containers. The system comprises a conveyor for transporting a row of containers, a sleeving unit for arranging sleeves around containers and a heat oven for attaching the sleeve around the container by heat shrinking. The conveyed containers are provided with a sleeve and the sleeved container is transported in the oven to allow the sleeve to shrink. According to the invention part of the sleeve is removed using a removal unit. The part is removed after heat shrinking. Removing the part allows to uncover part of the container otherwise covered by sleeve.

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Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift wijkt af van de oorspronkelijk ingediende stukken. Alle ingediende stukken kunnen bij NL Octrooicentrum worden ingezien.

Method and system for forming sleeved containers

The invention relates to a method and system for forming sleeved products such as sleeved or labelled containers. The method and system particularly relate to a processing of sleeves and products such as containers and to sleeving the product, such as a container.

It is known to provide a method for forming sleeved containers comprising, conveying a row of containers, arranging sleeves around the containers being conveyed, and attaching the sleeve to the container being conveyed by heat shrinking.

In such a method a tubular film is used as sleeve. A container, such as a PET bottle is filled with beverages such as soft drinks and generally has a cylindrical shape. It is positioned onto and carried by a transporter such as a conveyor. The film is brought around the container and will be moved through a heat oven.

A generally cylindrical label is often formed of a shrink film on which a brand name, information on the contents of the container and the like is printed. A label or film mounting system fits the envelope of film over the container

A problem with known methods and systems for forming a heat shrunk sleeved container is that heat shrinking can cause disturbances such as 'smiling' or wrinkling of the film.

A further problem is that it is up to now impossible to obtain a curved ending of films instead of straight endings. As a result of the anisotropic nature of sleeve films, heat shrinking the sleeve necessitates film sleeve tubes with a straight ending. Curved endings can have a higher consumer appeal.

Document EP 2 374 603 A1 discloses a method and system for forming sleeved containers. The system comprises a removal unit for removing a part of the sleeve before the sleeve is shrunk around the container. The known method and system have disadvantages similar to at least one of the problems discussed above.

It is therefore a goal of the invention to improve the known method of high speed sleeving of container, increasing the appeal of the sleeved container, without significantly increasing the production costs.

This goal is obtained with the known method further comprising removing a part of the attached sleeve. By removing part of the attached sleeve the disturbance caused by heat shrinking can be removed from the product and/or a curved ending can be obtained.

In this application removing a part of the sleeve is limited to actually removing a surface part of the sleeve as scrap. The part of the sleeve that still covers the container is the remaining sleeve part.

Although JP6127535A describes a method for forming sleeved containers having a heat shrinkable film provided with a cut to allow easy removal of the film. This known method lacks actual removal of a part of the sleeve during production. The known method intends to allow a user, after production, to remove the complete film, not a part of the film.

Also JP53123294A and JP5899336A disclose methods to fully remove a seal from a container, e.g. for recycling purposes. None of the disclosures is directed at improving the method for forming sleeved containers.

Although a part of the sleeve can be removed prior to heat shrinking, this could cause deformations in the film during and after heat shrinking. Preferably according to the

method removing the part is performed after heat shrinking. In this method the part to be removed is present during heat shrinking.

5 In an embodiment of the method removing the part of the sleeve comprises cutting the part out of the sleeve. Cutting the part to be removed allows separating the remaining sleeve part around the container from the removed part.

10 In an embodiment removing the part of the sleeve comprises at least two separate steps performed in different stages of the method. In a first step forming of the part of the sleeve to be removed is initiated. This forming can comprise partially cutting the part to be removed. Cutting can comprise forming perforation. By forming perforation the sleeve part that is to be removed is still connected to the rest of the sleeve. In a subsequent step, performed
15 downstream the sleeve part to be removed is completely detached from the remaining part of the sleeve. This allows collecting the detached part in this step of the method.

20 In an embodiment at least detaching the part of the sleeve is performed after heat shrinking. During heat shrinking the part to be removed is still present and is exposed to heat shrinking. During the heat shrinking step is close to undisturbed. Still an initial step to allow removal of the sleeve part to be removed can already be performed,
25 such as applying perforations, upstream from the heat shrinking step.

In an embodiment removing the part of the sleeve comprises laser cutting the part out of the sleeve. Laser
30 cutting can be performed on the fly, that is while the sleeved container is being conveyed.

Laser cutting is known, e.g. from W099/51386. It was discovered that a laser cutting method can be used in

combination with heat shrunk sleeves around a container,
with a minimum of damage to the container for removing a
part of the sleeve. This allows using the methods and
apparatus disclosed in W099/51386 can be used in combination
5 with the method of this invention even though the
methods/apparatus according W099/51386 are disclosed for
laser cutting a single layer of foil only.

It was further discovered that even though the
foil sleeves are curved around the container, not in a
10 single plane, a laser cutting method can be used for cutting
a part of the sleeve and (partially) detaching it from the
remaining part of the sleeve.

In a further embodiment the laser cutting
comprises ventilating vapours formed by the laser cutting
15 process. Vapours occur as a result of laser cutting and
these vapours can disturb subsequent laser cutting of a next
sleeved container. By ventilating the vapours e.g. by
providing suction, the possibly harmful vapours are removed
from the laser cutting site.

20 In an embodiment the laser cutting comprises
guiding a laser beam over the sleeve to cut a desired part
of the sleeve around the container being conveyed. The
position of the resulting laser beam, and in particular the
laser point can be controlled such that a pattern is cut
25 into the sleeve. Suitable control of the laser spot can be
obtained by using movable reflectors/mirrors.

Preferably the method comprises focussing a laser
beam onto the sleeve. By focussing the laser beam, the power
of the laser beam is focussed. In an embodiment a laser unit
30 having automatic focus is used.

Although the method can be used to remove a part
of the sleeve near the outer edge of the sleeve, such as to
create a curved ending or to remove smiling, in a preferred

embodiment the part of the sleeve that is to be removed is remote from a peripheral edge of the sleeve. A through hole is formed in the sleeve.

5 In an embodiment laser cutting the part of the sleeve comprises irradiating boundaries of the part, wherein boundaries extending in a circumferential direction of the container are irradiated more than boundaries extending in an axial direction of the container. As a result of the use of anisotropic heat shrinkage sleeve material, the cutting
10 behaviour of the sleeve is different in the horizontal (circumferential direction of the container, i.e. the heat shrinkage direction) versus the vertical (axial direction of the container, i.e. perpendicular to the heat shrinkage direction). The vertical cut is easier to realize than the
15 horizontal cut.

Because of the heat produced during cutting the sleeve wants to shrink which opens the sleeve by itself. This behaviour can be used to reach optimal cutting speed, wherein the vertical cuts can be made at higher speed than
20 horizontal cuts or vertical cuts can be made with less power.

In an embodiment removing the part of the sleeve comprises air sucking the part of the sleeve from the sleeved containers being conveyed. By using air sucking the
25 part of the sleeve is removed as a scrap material and is collected. This prevents loose scraps at the production site. The air sucking can be used to completely detach a still partially connected part of the sleeve, e.g. by breaking the connections with the remaining sleeve part.

30 In an embodiment the method comprises providing an area of under pressure, conveying the sleeved containers through the area of under pressure and disposing the part of the sleeve to be removed.

In an embodiment removing the part of the sleeve comprises engaging the part of the sleeve e.g. by clipping and squeezing. The engaged part is torn from the remaining label by twisting the part. This mechanical removing is very
5 reliable.

In an embodiment the method further comprises covering a chamber formed on an outer surface of the container by the sleeve and wherein removing the part of the sleeve uncovers the chamber. The outer surface of the
10 container or bottle can have a chamber having a depth with respect to the rest of the outer surface. The heat shrunk sleeve is stretched over the chamber covering the chamber. By removing the part of the sleeve covering the chamber, said chamber become accessible from the outside and can be
15 used e.g. as a handle for easily gripping/holding the sleeved container.

In an embodiment a toy or an article can be received in the chamber formed in the bottle and covered by the sleeve.

20 In an embodiment conveying the row of containers comprises measuring a position of a conveyed container and wherein removing the part of the sleeve is triggered, with a delay, by the measured position. Detecting the position of the sleeved container in combination with the velocity of
25 the conveyor allows calculating the arrival time of the container in the area suited for laser cutting.

In an embodiment conveying the row of containers comprises moving the containers at a speed of at least 1 m/s, preferably 5 m/s. This allows forming sleeved
30 containers at high speeds and low costs.

In an embodiment the method further comprises removing water droplets on the sleeved containers after heat shrinking the sleeves. This prevents the presence of water

droplets on the sleeve that could disturb e.g. the laser cutting. The water droplets can unfocus/scatter the later beam, resulting in less power for cutting the film.

In an embodiment attaching the sleeve to the container also comprises gluing the sleeve to the container. Preferably boundary parts of the remaining sleeve part around the container are provided with glue. After removal of the part of the sleeve the remaining part of the sleeve is still well bounded or attached to the container.

According to a further aspect a system for forming sleeved containers is provided. The system can comprise a conveyor, a sleeving unit and a heat oven. The conveyor is arranged for transporting a row of containers. The sleeving unit can arrange sleeves around containers, the sleeving unit arranged to cooperate with the conveyor. The heat oven can attach the sleeve around the container by heat shrinking. The conveyor is arranged through the heat oven downstream from the sleeving unit. Such a system can manufacture sleeved containers at high speed with low costs. The system is improved when the system comprises a removal unit for removing a part of the sleeve and arranged along the conveyor downstream from the heat oven. The removal unit allows removing a part of the sleeve. Disturbances as a result of heat shrinking, such as 'smiling' can be reduced. By removing an ending part of the sleeve curved endings of the sleeves can be obtained.

In an embodiment the removal unit comprises a laser device for irradiating the sleeve and cutting the part of the sleeve. This allows to laser cut the part of the sleeve that is to be removed. When cutting with a laser there are little limitations of the shape of the cutting line. It is also possible to cut out a piece of sleeve at the cutting line. Laser cutting has no wearing parts, has

improved reliability of cutting with mechanical parts, such as blades, has much easier operator handling and can be adjusted quickly.

In an embodiment the laser device comprises a control device for directing a laser beam onto the sleeve around the container being conveyed in a pattern in accordance with the part of the sleeve to be removed. In an embodiment the laser unit comprises a memory for storing a program for cutting a desired part of the sleeve. From e.g. W099/51386 it is known how to cut a desired pattern in a moving object, on the fly.

In an embodiment the removal unit further comprises a ventilation device for removing vapours formed as a result of laser beam irradiating the sleeve. Not collecting the vapours could eventually disturb the cutting process.

In an embodiment a sensor is arranged upstream from the laser unit along the conveyor for measuring a position of the sleeved container, the sensor connected to the laser unit arranged to initiate the laser unit to cut the desired part of the sleeve. The sensor allows tracking the position of the container/sleeve with respect to the sensor and eventually with respect to the laser. If the sensor is positioned a distance upstream from the laser, initiating the cutting with the laser is started after sensing the arrival of a sleeved container at the sensor with a short delay, dependent on the speed of the conveyor.

In an embodiment the laser unit comprises a power configuration device for varying the laser beam power. This allows varying the intensity of the laser beam during cutting. In an embodiment axial cuts in the sleeve are performed with less power than horizontal/circumferential cuts.

In an embodiment the removal unit comprises an air suction unit positioned along the conveyor for removing the part of the sleeve by air suction. The air suction unit, in an embodiment a vacuum cleaner, allows the final detaching
5 of the part of the sleeve that is to be removed.

Preferably the part of the sleeve that is to be removed is prevented from falling out too early by not cutting the part loose completely. The remainder part of the connection is weak and can be broken by suction forces.

10 In an embodiment the air suction unit is positioned downstream from the laser unit. Air inlets are formed between the air suction unit and laser unit for allowing inflow of air to the conveyor. Both laser unit and air suction unit can comprise an air vent. The inlets
15 prevent the two air vents from disturbing each other.

In an embodiment the air suction unit comprises an inlet hose positioned along the conveyor directed at least in an upstream transport direction. Preferably the inlet hose is directed at an angle between 20 - 75 degrees with
20 respect to the conveyor direction. During removal of the part of the sleeve, the suction force takes the foil part out into the suction opening or inlet hose. In the meantime the sleeved container is transported further on and the foil becomes more and more folded around the corner of the
25 suction opening. The forces that now pull on the sleeve can be bigger than the suction force alone. This improves the reliability of removing the foil.

In an embodiment the system further comprises a drying unit positioned downstream from the heat over along
30 the conveyor arranged to dry sleeved containers. This removes water droplets present on the sleeved container that could disturb the laser cutting.

Now the invention will be disclosed in more detail referring to the drawings showing embodiments of the invention. The shown embodiments do not limit the scope of protection of the invention but illustrate examples thereof.

5 It will be clear to a person skilled in the art that features mentioned in the embodiments illustrate preferred embodiments, but can be replaced by other less preferred features. A skilled person will be able to generalize the examples as provided and these examples are also part of
10 this disclosure and divisional applications could be directed at these explicit or implicit or generalized features.

The drawing shows:

Fig. 1A a view in perspective of a system and method
15 according to a first embodiment;

Fig. 1B shows a top view of the first embodiment,

Figs. 2A-2C show steps of the method and device according to the first embodiment of the invention,

Fig. 3 shows a perspective view of an apparatus
20 according to an embodiment of the invention;

Fig. 4 shows a third embodiment of the invention;

Fig. 5 shows a fourth embodiment according to the invention;

Fig. 6, 7 and 8 show other embodiments of a container.

25 Fig. 1A shows schematically a part 1 of a system for arranging a sleeve around a container, said system specifically arranged for removing a part of a heat shrunk foil or sleeve 2 arranged around a container 3 such as a one liter bottle 3 as shown in fig. 1.

30 Containers 3 are filled with a product such as a liquid in particular a nutritious fluid, but can also be filled with a solid such as a granulate laundry detergent. In some embodiment the container can comprise pens or

batteries. The invention is not limited by the shape, size and content of product, such as container 3. Container 3 can have a closure 4 such as a lid or dispenser. The invention is not limited by the form of the closure 4.

5 Label 2 is arranged to display useful information regarding the content of the bottle 3. It can provide trademarks indications, content indications and other graphics for recognition of the potential buyer of the container. Containers 3 with labels 2 are provided to
10 wholesale stores, grocery stores and are sold in packs or sold separately.

 In a first step of an embodiment of the method and in an upstream part of the system according to the invention, not shown in Figure 1, the containers 3 are filled. The
15 filled containers 3 are positioned on a conveyor such as a conveyor 5 supporting the container 3 in a standing or upright position. The invention is not limited to the position of the container.

 In the shown embodiment in fig. 1A container 3 has an
20 axial direction 6 and a circumferential direction 7. The invention is not limited by the cross-section of containers. Generally it will be possible to recognize an axial direction 6 as the direction of the bottle having one end provided with the closure 4. The circumferential direction 7
25 can be defined by the direction surrounding the axial direction 6. Label 2 is provided in the circumferential direction 7 and is provided around the axial direction 6.

 As part of the method and device according to the invention an upright container 2 is fed by a conveyor to a
30 sleeving device arranging sleeves around the container. In an embodiment the sleeving device comprises a foil feeder. Foil is fed to the sleeving device and in particular to a mandrel that opens the foil into a tubular shape. The foil

is cut to obtain individual sleeves. The individual sleeves are transported and arranged over a container 3. In a subsequent step the label/sleeve 2 is heat shrunk in an oven around the container 3. The label 2 now tightly fits around the container such that it is attached to the container. 5 Sleeving devices, foil feeding and heat shrink ovens are known as such. Reference is made to earlier applications by the same applicant, included by reference, such as WO2011/031160, WO 2008/088210 A1 and NL application number 10 2006752. In a further step of an embodiment invention the labeled container is dried such that liquid droplets are removed.

A method can comprise further steps for handling and processing the container and sleeve as well as the labeled 15 container. The containers with heat shrunk labeled 2 are provided to conveyor 5 at an upstream end 9 of system 1.

Filling of containers, sleeving and heat shrinking can be performed at different, possibly remote, locations.

Containers 3 are provided near the upstream end 9 of 20 system 1 and are conveyed by conveyor 5 in direction 10. As a first step of the embodiment shown in Figure 1A the containers 3 are positioned at a generally exact position with respect to a fixed point of the (not shown) frame of the system 1.

25 In Figure 1B distance 11 shows such a fixed distance. In Fig. 1B distance 11 is the distance between a side 12 of container 3 and the tip of laser device 13. Guides 15 are positioned on both sides of the conveyor 5 in a V-shape/funnel shape directing the containers to the centre of 30 the conveyor 5.

In the shown embodiments the container 3 is positioned centrally along the longitudinal axis of conveyor 5. The guides 15 are positioned such that a space in between is

exactly enough to allow passage of container 3 in the conveyor direction 10.

When conveyed downstream according to direction 10 as a further step of the method the container 3 is transported
5 along sensor 19. Sensor 19 can detect presence of a container in front of the sensor. Detection results in transmission of a trigger signal 20 that can be sent to laser device 13 or laser control 30.

10 In another embodiment sensor 19 is arranged to capture an image. Sensor 19 can be connected to a controller allowing to compare a captured image with a memorized picture. Certain captured images can trigger the transmittal of a trigger signal 20.

Trigger signal 20 triggered by arrival of a front end
15 of container 3 in front of sensor 19, in combination with a conveyor speed 18 allows the laser device 13 or a laser control 30 to calculate the arrival time of the container 2 in front of the laser 13 or at least within a operating window 25 of the laser spot. The conveyor speed 18 is in an
20 embodiment at least 1 m/s. The trigger sensor 19, in particular in combination with the guides 15, results in specific knowledge of the position of the container 3 when moved by conveyor 5 and allows synchronizing downstream applications with the arrival of labeled containers 3.

25 The operating window 25 of laser device 13 is the window within which the laser spot 26 can operate on the label 2. The laser spot 26 is directed by e.g. reflectors present within the laser device 13. As the area of focus of the laser device is limited as well as the angle of the
30 reflectors, the laser spot is applied to the label 2 within a limited window of operation.

Laser device 13 fixated to a (not shown) frame, is shown schematically only in Figure 1A. Laser device 13 is

mounted to a (not shown) frame of the system 1. The laser device 13 is directed towards the conveyor (also fixed to the frame), and more specifically at the labels 2 around containers 3 transported by conveyor 5. The laser device 13 is connected to an energy source and can be connected to or can comprise a laser control 30.

Laser control 30 can configure e.g. the power of the laser beam, the direction of the laser beam and on/off. The direct of the laser beam can be controlled by driving reflectors in the laser device 13.

In an embodiment laser control 30 comprises a memory 31. Memory 31 can be an external memory, a programmable memory or can be a memory that can load a program. Memory 31 is suitable for storing a program comprising a path (or pattern) for the direction of the laser beam and more specifically the laser beam spot 26. The laser beam can be focused such that laser beam spot 26 is focussed on a distance 11 substantially equal to the distance between the tip of laser device 13 and the surface 12 of label 2 around container 3.

Memory 31 can provide a path, e.g. path 33 for the laser beam spot 26. If the laser beam spot 26 executes path 33, the laser beam spot will cut a generally rectangular shape 34 in label 2.

Trigger signal 20 as provided by sensor 19 can trigger the laser device 13, via control 30, to initiate the cutting of label 2 according to the loaded pattern.

In an embodiment transport of the container 3 with label 2 is temporarily stopped in front of laser device 13. The laser beam spot 26 executes path 33 and part 34 is cut.

In another, more preferred embodiment, the container 3 is moving during cutting. In this embodiment the path 33 is corrected for the velocity V 18 of conveyor 5 in direction

10. A skilled person will be able to configure a cutting path 33 that will cut a part 34 in label 2 while moving. In an embodiment control 30 is provided with velocity V 18 is comprises a program to adapt a path 33 provided by memory 31
5 dependent on the velocity V 18.

Due to a difference in thickness of material used for the container 3 and label 2 and as a result of optimum control of laser power toward the cutting path 33, laser cutting label 2 will cut label 2 with a minimum damage to
10 container 3, even when container 3 is formed from a similar plastic material as the sleeve. Container 3 will be formed of material with greater thickness. The laser beam will not melt and cut the container wall.

In an embodiment a wall of the container 3 is formed at
15 a distance from the part of label 2 that is to be cut. An example is shown in Figure 6. Wall 49 is covered by label 203 but is positioned at a distance from the label 203. Due to the difference in distance, the wall 49 of the container 200 is positioned at a greater distance from laser beam spot
20 26, such that that wall 49 part of the container 203 will receive laser light that is not completely in focus, lowering the power of the laser spot, resulting in less damage/zero melting of the container wall.

Laser device 13 can be 60W, 10200 nm CO2 laser with
25 fixed focus or can be an automatic focus laser device. Other laser device are possible. Preferably a infrared or far-infrared laser device is used. In an embodiment laser device 13 can comprise multiple laser beams or multiple laser device 13 can be part of the system for forming sleeved
30 containers 1 according to the invention.

Part 34 is formed as a result of cutting the label 2. Shape 34 can have any circumference. In the shown embodiment part 34 is formed within label 2. In another embodiment part

34 is formed near an edge of label 2 and a part of shape 34 is part of the circumference of label 2.

Cutting the label 2 results in local melting of the label and evaporation of label material. Fumes or vapours 39 can be the result. Fumes 39 can be ventilated using a exhaust 40 having an entrance 42 near the laser window 25 of the laser device 13. Fumes 41 can be collected in a filter (not shown) or can be released at a safe location, e.g. outside the plant. A suitable pump (not shown) can be used to ventilate the fumes 39/41.

In an embodiment part 34 is separated from label 2 only partially. As a result of the partial separation part 34 will hold its position with respect to label 2. Further downstream from laser device 13, an air suction unit 50 is positioned having an inlet 51. The air suction unit 50 will provide a local under pressure at a position close to the passage of part 34 when the container 3 is transported further downstream. The local under pressure will result in tearing the remaining connections of part 34 with label 2. Part 52 is released and can be collected for disposal. In this embodiment the removed parts can be collected and the plant is not contaminated with loose parts 34.

Inlet 51 has an inlet direction 55. Direction 55 is positioned at an angle α with respect to the transport direction 18.

After removal of part 34, a container 60 having a label 61 without a part 62 is obtained.

In Fig. 2A a labelled container 100 having a sleeve 101 arranged around and attached to the container by heat shrinking is provided by conveyor 102. Guiding plates 103,104 are funnel shaped in the conveyor direction 105. Guiding plates 103,104 position the container 100 at a fixed distance with respect to the conveyor/frame (not shown).

As the container 100 moves downstream in direction 105, the container will pass sensor 106. Passage of the container 100 will trigger a trigger signal that is sent to laser device 107. Laser device 107 will be able to calculate when
5 the container will arrive in the operating window 108 of laser device 107. The operating window is the window in which laser device 107 can aim the laser beam spot using e.g. actuators for moving reflectors.

10 Triggering of the laser device 107 is especially important when the position of the part 115 that is to be removed is important with respect to the position of the container. The sensor in combination with the positioning guides 103/104 position the container and allow cutting of a part 115 with an exact position with respect to the
15 container.

In another embodiment a sensor can recognize a sign or graphic that is present on the label. When recognized, the sensor will send a trigger signal. In that case the label position is more important and laser cutting is synchronized
20 with the label position.

Figure 2B shows the container 100 in the operating window 108 of laser device 107. The laser device 107 is now 'on' and laser beam spot is directed toward position 109.

In this embodiment a laser cut 110 is made of generally
25 rectangular shape in label 101. In this embodiment cutting was started near starting point 111 and the spot was moved such that cut 112 was created onto the current position of spot 109. From spot 109 the laser spot will be moved more or less horizontal (in the circumferential direction 114 of
30 container 100 having an axial direction 113). The laser spot will than coincide with a location already cut.

Moving the spot 109 over the surface of label 101 will result in partial melting and/or evaporation of the label

material. The power of laser cutting can be dosed such that the laser spot cuts most of the label, but still some partial connections remain. As a result the part 115 that is to be removed will still hold position.

5 As the label 101 is a heat shrink material, it will have heat shrinking properties, such as anisotropic shrinking properties in the vertical and horizontal directions. As the sleeve will shrink mostly in the circumferential direction 114, most tensions in the label
10 will be present in this direction. As a result, the part 115 that is to be removed, will separate more easily with respect to vertical cutting lines, such as line 110, than horizontal cutting line, such as the cutting line being cut by spot 109. Further as a result, the power of the laser
15 spot can be lower in vertical cutting lines of the path than horizontal lines. This is controlled by the laser device e.g. by moving the laser spot quicker in vertical parts of the cutting line than horizontal parts. In another
20 embodiment the power of the laser/laser spot is varied accordingly. The movement and/or power control can be calculated by the laser device 107 or laser control 30 or can be calculated using an outside source and is inputted via memory 31 into the laser device 13,107.

 In a further step of the method as shown in Figure 2c
25 the container 100 is transported downstream. The complete cutting pattern is now applied to the label 101. The part to be removed 115 is only partially still connected to the label. The air inlet 120 of hose 121 is directed towards the conveyor 102.

30 It will be clear for the person skilled in the art that other patterns different from the rectangular part 115 can be used in combination with the invention.

In another embodiment only a perforation line is formed in the label.

In yet another embodiment a label is arranged around the container already having a perforation line prior to
5 heat shrinking. The perforated line can be formed prior to sleeving the container. The laser cutting is not necessary in such an embodiment.

Triggering as a result of the position of the container or label can still be used to position the part to be
10 removed/container with respect to the part removal unit 121.

As a further step of the method, air is sucked into the part removal unit formed by hose 121 connected to a vacuum pump (not shown). As a result of the penetrations in the label 101, it was discovered that this results in an under
15 pressure in the area behind the label, between the part 115 to be removed and the container wall surrounded by the label, especially when a chamber is formed between label 101 and the container wall. The chamber can be the result of a cavity or retracted surface of the container 100. This under
20 pressure first results in the part 115 to be moved backwards, into the chamber. This results in tearing of the partial connections that still connect the part 115 with the label. In a further step at first the vertical cutting line 129 tears and the part 115 is sucked outwardly into a
25 position as shown in Figure 2C. While the container 100/conveyor 102 is still moving forward the loose end 130 will collide with the air inlet 120. Friction as a result of the collision, the moving on of the container 100 on the conveyor 102 and the air suction will result in tearing the
30 remaining partial connections and disposal 132 of the part 115 to be removed.

In an embodiment glue or another attachment product is applied to or near the cutting lines of the part to be

removed. This allows attaching the remaining edge of the separated part to be connected to the container, which will decrease the chances of further tearing of the label near the removed part.

5 Other embodiments for removing the part 115 also fall within the scope of protection. A part removal unit can comprise an engagement tool such as a clip, to squeeze a part of the foil to be removed between two arms of the clip. As a part is gripped, the clip/two arms can rotate in order
10 to tear the part to be removed from the remaining label.

 Figure 3 shows a further embodiment of the partial system according to figure 1. Now parts of the frame 70 are shown. In the shown embodiment conveyor 5 is surrounded by respective housing parts 71,72,73. Housing 71 surrounds the
15 position guides 15, housing 72 surrounds the laser device 13 and housing 73 partially surrounds the part removal unit. Figure 3 shows more details with respect to the part removal unit.

 Housing 73 is provided with several openings. The
20 openings allow air to reach the inner housing. As both housings 72 and 73 are provided with a ventilation unit, for ventilating vapours and removing the label part respectively, inlet of air from outside housing 73 is preferred as otherwise the ventilations would hinder each
25 other. Draught from the part removal unit could result in spreading the vapours resulting from laser cutting.

 The part removal unit comprises in an embodiment two hoses 75,76 connected to the inlet (not shown in figure 3). Each hose is connected to a respective chamber 77,78
30 comprising a filter bag 79,80, similar to a bag in vacuum cleaner. The chambers 77,78 are closed by a door 81.82 and connected to one or more pumps. In an embodiment a switch is provided that allows to switch between creating an under

pressure in chamber 77 and chamber 78. A under pressure can be created in the respective chambers 77,78. The filter bags allow penetration of air, but not of material particles.

This allows collecting the removed parts in the filter bags 5 79,80. If a bag is full, this can be detected automatically with a suitable sensor, not shown, the part removal unit can switch from 'vacuum cleaning' with a full filter bag to the empty filter bag. This allows continuous operation. The full filter bag can be replaced by an operator by opening the 10 door.

Figure 4 shows, very schematically another embodiment of the method and system according to the invention. A container 140 is transported on a conveyor 141 in direction 142. It reaches a sleeving station 143. Sleeving station 143 15 is provided with foil 144 of uncut sleeves. In the sleeving station sleeves 145 are formed by cutting from the foil 144 and arranged 146 over the container 140. This can be a continuous process and is well known as such from prior art.

A sleeved container 147 is transported to an oven 148. 20 In the oven the sleeve will be heated to shrink by, such as heated steam vapor, resulting in attaching the sleeve around the container. The container is now a labelled container 149.

In a further downstream station 150 the labelled 25 container is dried to remove water droplets. Station 151 is a schematic representation of the system as shown in Figure 1 and comprises a positioning, trigger sensor, laser cutter and part removal unit as described earlier.

Figure 4 shows an embodiment of a complete system for 30 sleeving a container and removing part of the label after sleeving and heat shrinking.

Figure 5 shows yet another embodiment. Foil 160 is now already provided with perforations 161. Foil 160 is fed to

sleeving unit 143. A separate sleeve 162 with perforation 163 is formed and arranged around a container 140.

After heat shrinking the sleeve 162 around the container, the labelled container having the perforation 166
5 can either be processed further, step 167, to an embodiment of the part removal unit 169, e.g. embodied by an air inlet as described above. In an embodiment the part removal unit comprises the sensor 106 for triggering the part removal. The part removal unit 169 can remove the part of the label
10 surrounded by perforations. This results in end product 170: a labelled container having a part 171 of the label removed.

In another embodiment, step 168, the sleeved container 166 is not processed further and a sleeved container 173 having a part 174 surrounded by perforations 175 is
15 obtained.

Further the laser cutting according to the invention can be used to remove irregularities such as irregularities as a result of heat shrinking the sleeve. Occasionally pieces of foil/sleeve arranged around a container can show
20 'smiling'. These irregularities can be sensed by a suitable sensor 106, informing and triggering the laser device 107 to apply a certain laser cutting pattern, e.g. uploaded via memory 31 connected to the sensor 106. After laser cutting the part is removed using the part removal unit 120.

Figure 6 shows a labelled container 200 that can be obtained using an embodiment of the method described in this document. Container 200 has a chamber 201 formed in side
25 wall 202 of the container. This chamber 201 is a deepening in the container. In an embodiment the deepening can be form a handle allowing to grip the large container with fingers
30 positioned in the deepening. To position the fingers in the chamber 201, part of the label covering the chamber 201 after sleeving is removed according to the invention.

In another embodiment label 203 is provided with a perforation, either by laser cutting according to any of the embodiments shown or as a result of prior applied perforation in the foil as fed to the sleeving device as part of the system for sleeving a container. As a part of the sleeving device a product such as a toy can be positioned in the chamber 201 prior to sleeving and the small product such as a toy 205 is locked in the chamber 201 covered by the sleeve 203, especially after the heat shrinking step. A user can gain access to the chamber by removing the part of the label covering the chamber by tearing the part loose connected to the rest of the label by perforations only. This new product can be used for all kinds of advertisement purposes.

In yet another embodiment the shape of the label 182 arranged on the container 180 can be adapted. In an embodiment instead of the straight (horizontal) label (indicated by dotted line 183) at a bottom side of the label 182, part of that bottom side can be removed by laser cutting creating a curved ending 184 of the sleeve.

Near the top end 185 of the label 182 pigtails or 'smiling' as a result of excessive shrinking of the sleeve near this end having a reduced circumference, can be removed using the laser device. Using a sensor 19 having image capture capabilities, possible deformations can be recognized can be removed by first laser cutting at the desired (calculated) spot and removing the part e.g. by ventilating.

In an embodiment the curve 184 of the label is adapted to the curve 187 of the container 180, as shown in Figure 7.

Other patterns can be cut into the label using the laser device 107 or can be formed in label prior to heat shrinking. The invention is not limited in the shape of the

laser cutting. An example of a laser cutting pattern resulting in a perforation is shown in Figure 8 and comprises a helix like perforation 191 on container 190 having label 192. A user can grip a part of the sleeve/label and, with enough force, can tear the entire label from the container. An example of a sleeve having a helix like perforation is shown in Figure 8.

According to a further aspect of the invention a method and system are provided that allow laser cutting a labelled product such as a container, wherein the method and system provide for synchronizing the conveyed sleeved products with a laser device allowing to laser cut the desired part into the label. This method and system can be combined with any of the features described above. This method and system allow forming the product according to Figure 8. A perforation on any shape can be obtained.

Clauses

1. Method for forming sleeved containers (3)
comprising,

- 5 - conveying a row of containers,
 - arranging sleeves (101) around the containers being
 conveyed,
 - attaching the sleeve to the container being conveyed by
 heat shrinking,

10 **characterized by**

removing a part of the attached sleeve.

2. Method according to claim 1, wherein removing
the part of the sleeve is performed after heat shrinking and
wherein removing comprises cutting the part out of the
15 sleeve.

3. Method according to claim 1 or 2, wherein
removing the part of the sleeve comprises at least two steps
of (i) initiating the forming of the part of the sleeve to
be removed and (ii) completely detaching the part of the
20 sleeve, wherein at least detaching the part of the sleeve is
performed after heat shrinking.

4. Method according to claim 2 or 3, wherein
removing the part of the sleeve comprises laser cutting the
part out of the sleeve.

25 5. Method according to claim 4, wherein laser
cutting comprises ventilating vapours formed by the laser
cutting process.

6. Method according to claim 4 or 5, wherein
laser cutting comprises guiding a laser beam over the sleeve
30 to cut a desired part of the sleeve around the container
being conveyed.

7. Method according to any of the claims 4 - 6,
wherein laser cutting the part of the sleeve comprises

irradiating boundaries of the part, wherein boundaries extending in a circumferential direction of the container are irradiated more than boundaries extending in an axial direction of the container.

5 8. Method according to any of the preceding claims, wherein removing the part of the sleeve comprises air sucking the part of the sleeve from the sleeved containers being conveyed.

10 9. Method according to any of the preceding claims, wherein removing the part of the sleeve comprises engaging the part of the sleeve by piercing the sleeves of sleeved containers being conveyed.

15 10. Method according to any of the preceding claims, wherein the method further comprises covering a chamber formed on an outer surface of the container by the sleeve and wherein removing the part of the sleeve uncovers the chamber.

20 11. Method according to any of the preceding claims, wherein conveying the row of containers comprises detecting a position of a conveyed container and wherein removing the part of the sleeve is triggered, with a delay, by the detected position.

25 12. Method according to any of the preceding claims, wherein conveying the row of containers comprises moving the containers at a speed of at least 1 m/s.

 13. Method according to any of the preceding claims, wherein the method further comprises removing water droplets on the sleeved containers after heat shrinking the sleeves.

30 14. Method according to any of the preceding claims, wherein attaching the sleeve to the container also comprises gluing the sleeve to the container.

15. System for forming sleeved containers comprising a conveyor (5) for transporting a row of containers, a sleeving unit (143) for arranging sleeves around containers, the sleeving unit arranged to cooperate
5 with the conveyor, a heat oven for attaching the sleeve around the container by heat shrinking, the conveyor (5) arranged through the heat oven downstream from the sleeving unit, wherein the system further comprises a removal unit (120) for removing a part of the sleeve, **characterized in**
10 **that** the removal unit is arranged along the conveyor downstream from the heat oven.

16. System according to claim 15, wherein the removal unit comprises a laser device for irradiating the sleeve and cutting the part of the sleeve.

15 17. System according to claim 16, wherein the laser device comprises a control device for directing a laser beam onto the sleeve around the container being conveyed in a pattern in accordance with the part of the sleeve to be removed.

20 18. System according to claim 16 or 17, wherein the removal unit further comprises a ventilation device for removing vapours formed as a result of laser beam irradiating the sleeve.

25 19. System according to any of the claims 16 - 18, wherein a sensor is arranged upstream from the laser unit along the conveyor for detecting the sleeved container, the sensor connected to the laser unit arranged to initiate the laser unit to cut the desired part of the sleeve.

30 20. System according to any of the claims 16 - 19, wherein the laser unit comprises a memory for storing a program for cutting a desired part of the sleeve.

21. System according to any of the claims 16 - 20, wherein the laser unit comprises a power configuration device for varying the laser beam power.

5 22. System according to any of the claims 15 - 21, wherein the removal unit comprises an air suction unit positioned along the conveyor for removing the part of the sleeve by air suction.

10 23. System according to at least claims 18 and 22, wherein the removal unit comprising the air suction unit positioned downstream from the laser unit has air inlets directed towards the conveyor between the air suction unit and laser unit.

15 24. System according to claim 22 or 23, wherein the air suction unit comprises an inlet nozzle positioned along the conveyor directed at least in an upstream transport direction.

20 25. System according to any of the claims 15 - 24, wherein the system further comprises a drying unit positioned downstream from the heat oven along the conveyor arranged to dry sleeved containers.

Conclusies

1. Werkwijze voor het vormen containers (3) met hoesvormige folie-omhulling, omvatten,

- 5 - het transporteren van een rij van containers,
 - het aanbrengen van de hoesvormige folie-omhullingen (101) rond de getransporteerde containers,
 - het verbinden van de hoes met de getransporteerde container door middel van de warmte krimpen,

10 **met het kenmerk dat** de werkwijze verder omvat het verwijderen van een deel van de verbonden hoesvormige folie-omhulling.

2. Werkwijze volgens conclusie 1, waarbij het verwijderen van het deel van de hoesvormige folie-omhulling
15 uitgevoerd wordt na het krimpen, en waarbij het verwijderen omvat het snijden van het gedeelte uit de hoesvormige folie-omhulling.

3. Werkwijze volgens conclusie 1 of 2, waarbij het verwijderen van het deel van de hoesvormige folie-omhulling
20 ten minste de twee stappen omvat van (i) het starten van de vorming van het deel van de hoesvormige folie-omhulling dat verwijderd gaat worden en (ii) het volledig losmaken van de het deel van de hoesvormige folie-omhulling, waarbij ten
minste het losmaken van het deel van de hoesvormige folie-
25 omhulling uitgevoerd wordt na krimpen.

4. Werkwijze volgens conclusie 2 of 3, waarbij het verwijderen van het deel van de hoesvormige folie-omhulling
omvat het lasersnijden van het deel uit de hoesvormige folie-omhulling.

30 5. Werkwijze volgens conclusie 4, waarbij het lasersnijden omvat het ventileren van dampen gevormd tijdens het lasersnijden.

6. Werkwijze volgens conclusie 4 of 5, waarbij het lasersnijden omvat het leiden van een laserstraal over de hoesevormige folie-omhulling om een gewenst deel van de hoesevormige folie-omhulling rond de getransporteerde container uit te snijden.

7. Werkwijze volgens één van de conclusies 4 - 6, waarbij het lasersnijden van het deel van de hoesevormige folie-omhulling omvat het bestralen van de randen van het deel, waarbij randen die zich uitstrekken in een omtreksrichting van de container meer bestraald worden dan de randen die zich uitstrekken in een axiale richting van de container.

8. Werkwijze volgens één van de voorgaande conclusies, waarbij het verwijderen van het deel van de hoesevormige folie-omhulling omvat het met lucht afzuigen van het deel van de hoesevormige folie-omhulling van de getransporteerde containers met hoesevormige folie-omhulling.

9. Werkwijze volgens één van de voorgaande conclusies, waarbij het verwijderen van het deel van de hoesevormige folie-omhulling omvat het aangrijpen van het deel van de hoesevormige folie-omhulling door doorheen de hoesevormige folie-omhulling te prikken van de getransporteerde containers met hoesevormige folie-omhullingen.

10. Werkwijze volgens één van de voorgaande conclusies, waarbij de werkwijze verder omvat het afdekken van een kamer gevormd op een buitenste oppervlak van de container met de hoesevormige folie-omhulling en waarbij het verwijderen van het deel van de hoesevormige folie-omhulling die kamer openmaakt.

11. Werkwijze volgens één van de voorgaande conclusies, waarbij het transporteren van de rij van containers omvat het detecteren van een positie van een

getranporteerde container en waarbij het verwijderen van het deel van de hoesvormige folie-omhulling wordt geactiveerd, met een vertraging, op basis van de gedetecteerde positie.

5 12. Werkwijze volgens één van de voorgaande conclusies, waarbij het transporteren van de rij van containers omvat het verplaatsen van de containers met een snelheid van ten minste 1 m/s.

10 13. Werkwijze volgens één van de voorgaande conclusies, waarbij de werkwijze verder omvat het verwijderen van waterdruppels van de hoesvormige folie-omhullingen na het warmte krimpen van de hoesvormige folie-omhullingen.

15 14. Werkwijze volgens één van de voorgaande conclusies, waarbij het aanbrengen van de hoesvormige folie-omhulling om de container ook omvat het lijmen van de hoesvormige folie-omhulling aan de container.

20 15. Systeem voor het vormen van containers met hoesvormige folie-omhulling, omvattende een transportband (5) voor het transporteren van een rij van containers, een hoesvormige folie-omhulling aanbrengeneenheid (143) voor het aanbrengen van de hoesvormige folie-omhulling rond de container, waarbij de hoesvormige folie-omhulling aanbrengeneenheid ingericht is om samen te werken met de transportband, een oven voor het bevestigen van de
25 hoesvormige folie-omhulling rond de container door de warmte krimpen, waarbij de transportband is ingericht doorheen de oven voor stroomafwaarts van de hoesvormige folie-omhulling aanbrengeneenheid, waarbij het systeem verder een verwijdereenheid omvat voor het verwijderen van een deel van
30 de hoesvormige folie-omhulling;

met het kenmerk, dat de verwijdereenheid is aangebracht langs de transportband stroomafwaarts van de oven.

16. Systeem volgens conclusie 15, waarbij de verwijdereenheid een laserinrichting omvat voor het bestralen van de hoesvormige folie-omhulling en uitsnijden van het deel van de hoesvormige folie-omhulling.

5 17. Systeem volgens conclusie 16, waarbij de laserinrichting een controle-inrichting omvat voor het leiden van een laserstraal op de hoesvormige folie-omhulling rondom de getransporteerde container volgens een patroon in overeenstemming met het deel van de hoesvormige folie-
10 omhulling dat verwijderd wordt.

18. Systeem volgens conclusie 16 of 17, waarbij de verwijdereenheid verder omvat een ventilatie-inrichting voor het afvoeren van dampen die ontstaan als gevolg van bestraling met een laserstraal van de hoesvormige folie-
15 omhulling.

19. Systeem volgens een van de conclusies 16-18, waarbij een sensor stroomopwaarts van de laserinrichting aangebracht langs de transportband voor het detecteren van de container met hoesvormige folie-omhulling, waarbij de
20 sensor verbonden is met de laserinrichting ingericht om de laserinrichting met het snijden van het gewenste deel van de hoesvormige folie-omhulling te laten beginnen.

20. Systeem volgens een van de conclusies 16-19, waarbij de laserinrichting een geheugen omvat voor het
25 opslaan van een programma voor het snijden van een gewenst deel van de hoesvormige folie-omhulling.

21. Systeem volgens een van de conclusies 16-20, waarin de laserinrichting een vermogenregelaar omvat voor het variëren van het vermogen van de laserstraal.

30 22. Systeem volgens een van de conclusies 15 tot 21, waarbij de verwijdereenheid een lucht-afzuigenheid omvat geplaatst langs de transportband voor het verwijderen

van het deel van de hoesvormige folie-omhulling door lucht aanzuiging.

23. Systeem volgens ten minste conclusies 18 en 22, waarbij de verwijdereenheid, omvattende de lucht-afzuigenheid stroomafwaarts van de laserinrichting, 5 luchtinlaten heeft gericht op de lopende band tussen de lucht-afzuigenheid en laserinrichting.

24. Systeem volgens conclusie 22 of 23, waarbij de lucht-afzuigenheid een ingangmondstuk omvat die langs de transportband is geplaatst gericht op zijn minst in een 10 stroomopwaartse transportrichting.

25. Systeem volgens één van de conclusies 15-24, waarbij het systeem verder een drooginstallatie omvat stroomafwaarts van de oven langs de transportband ingericht 15 om containers met hoesvormige folie-omhullingen te drogen.

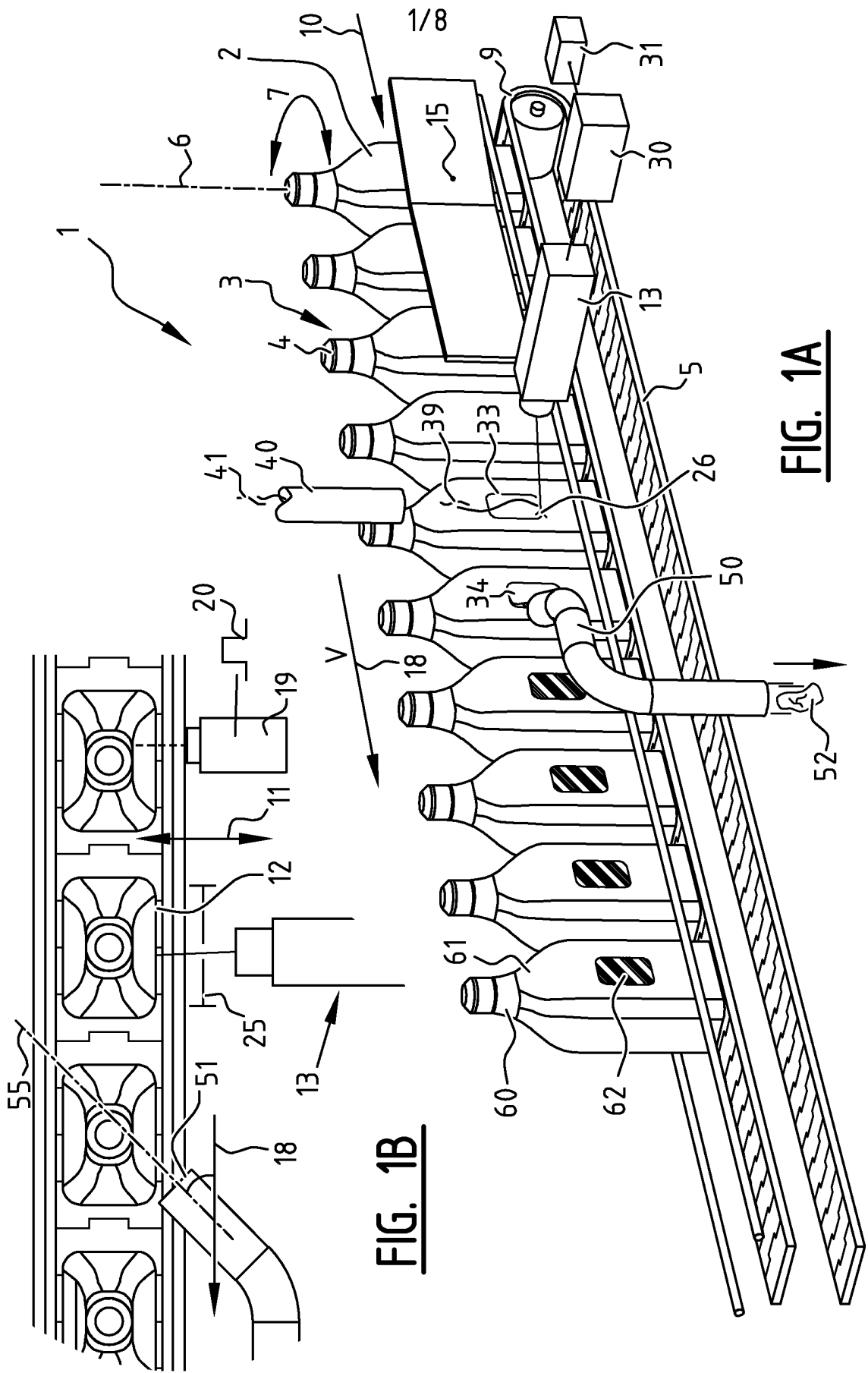


FIG. 1A

FIG. 1B

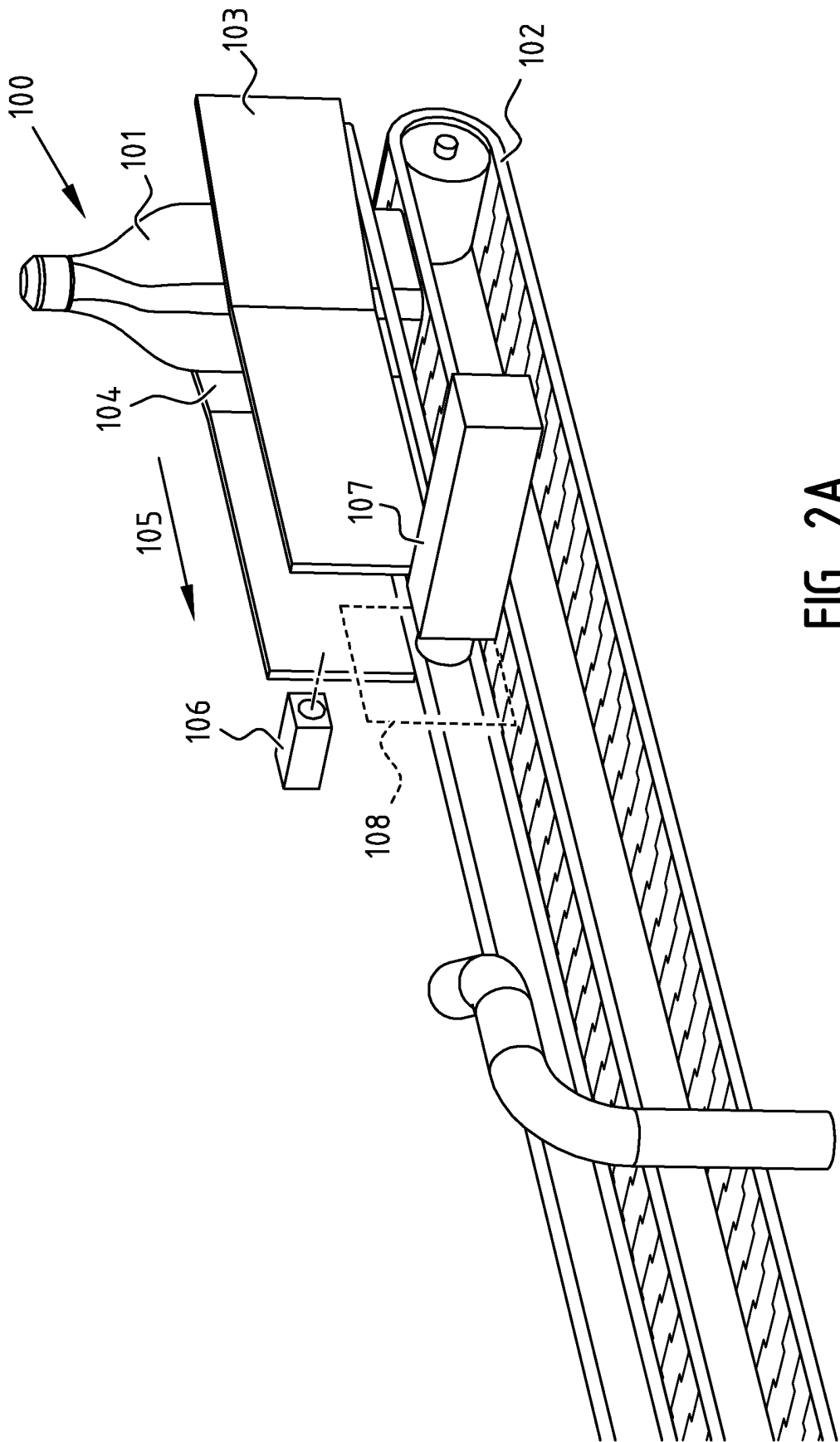


FIG. 2A

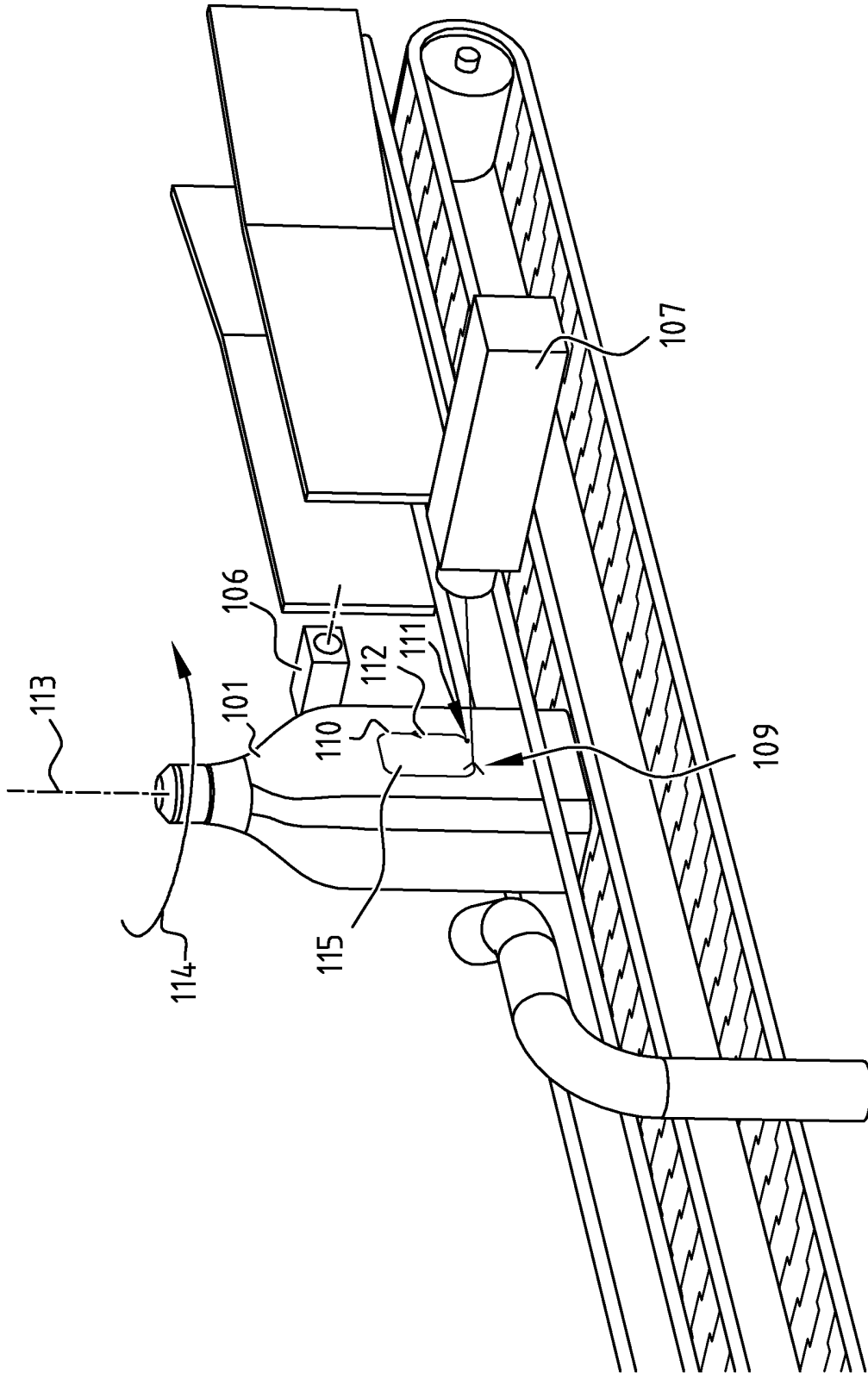


FIG. 2B

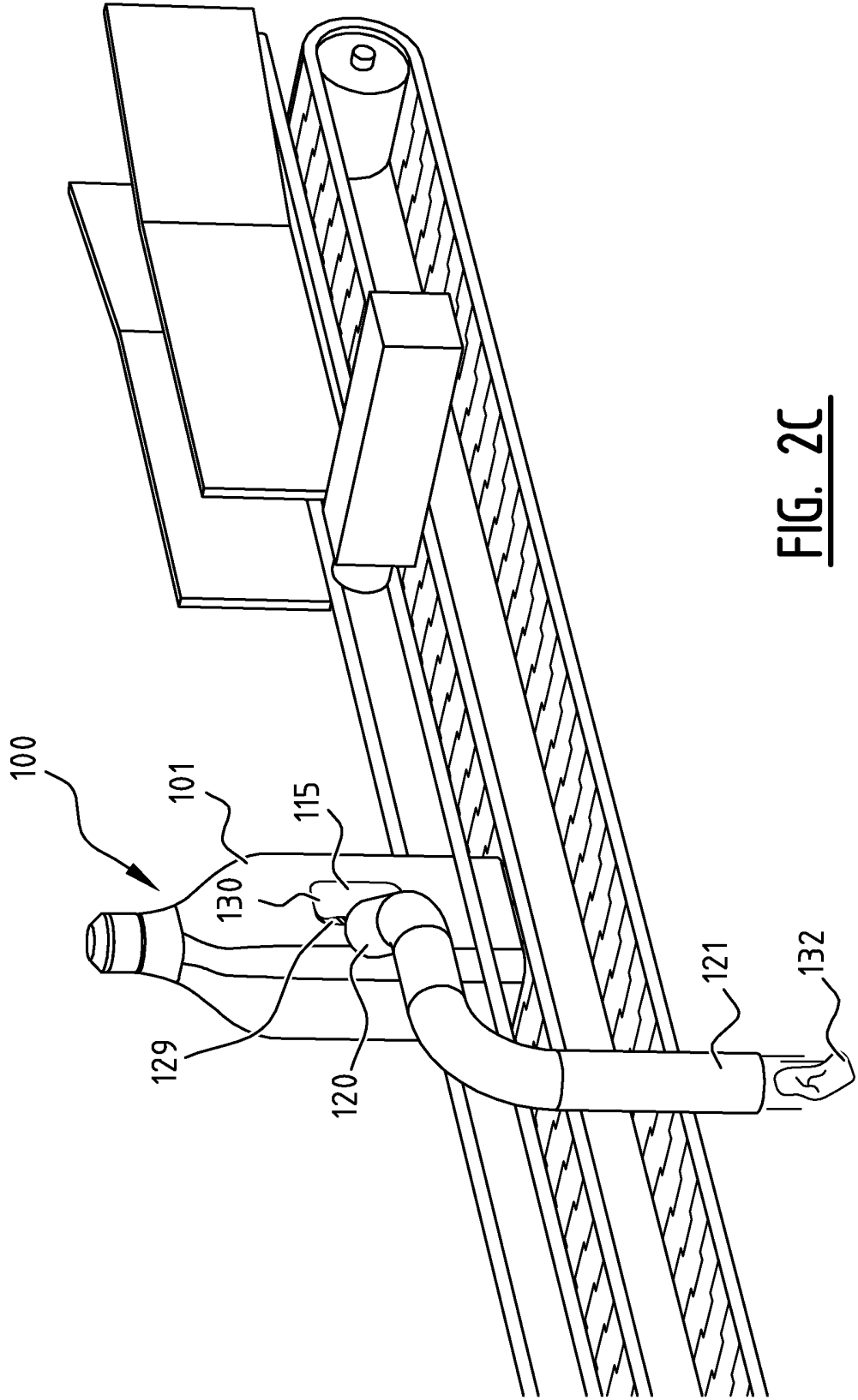


FIG. 2C

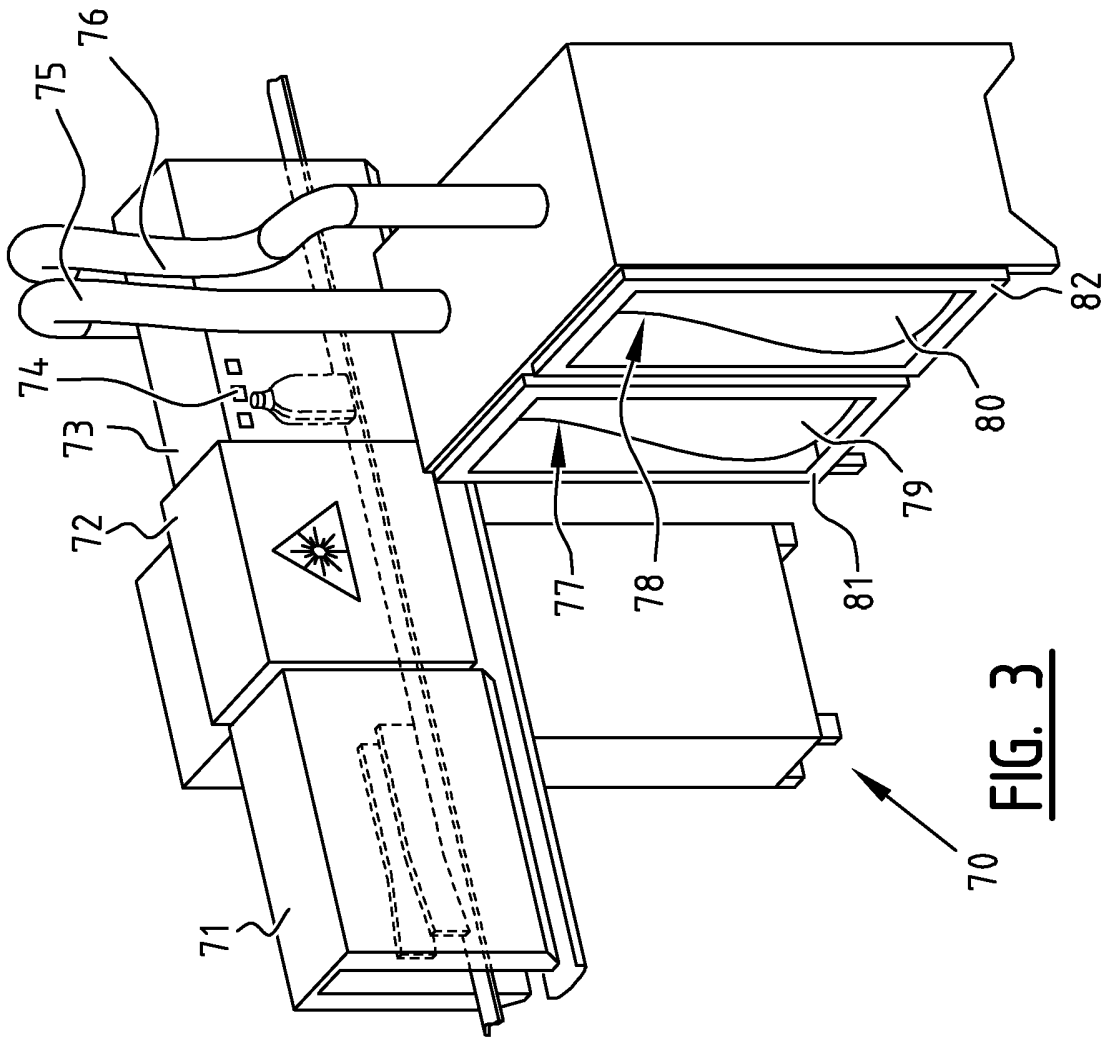


FIG. 3

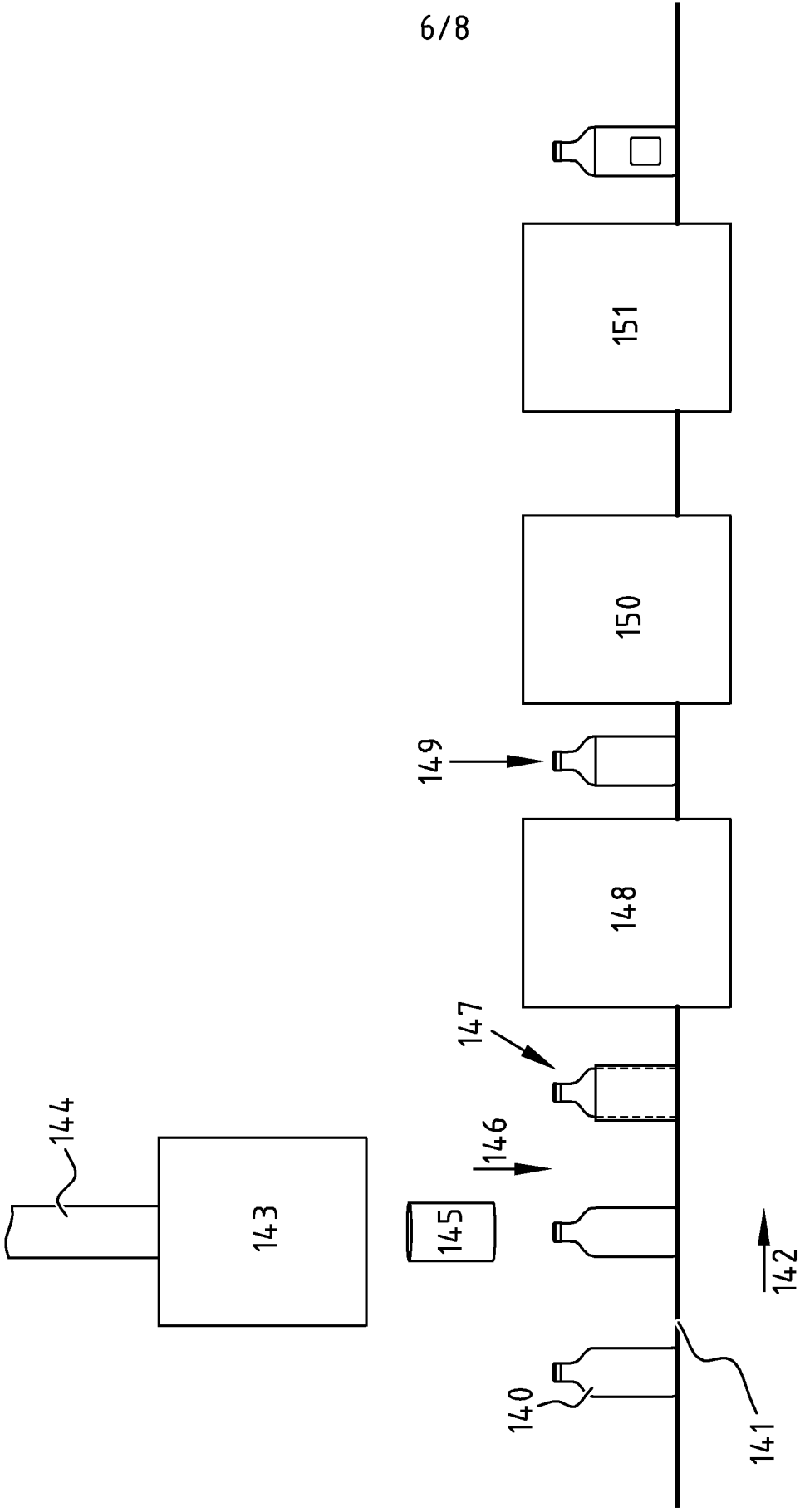


FIG. 4

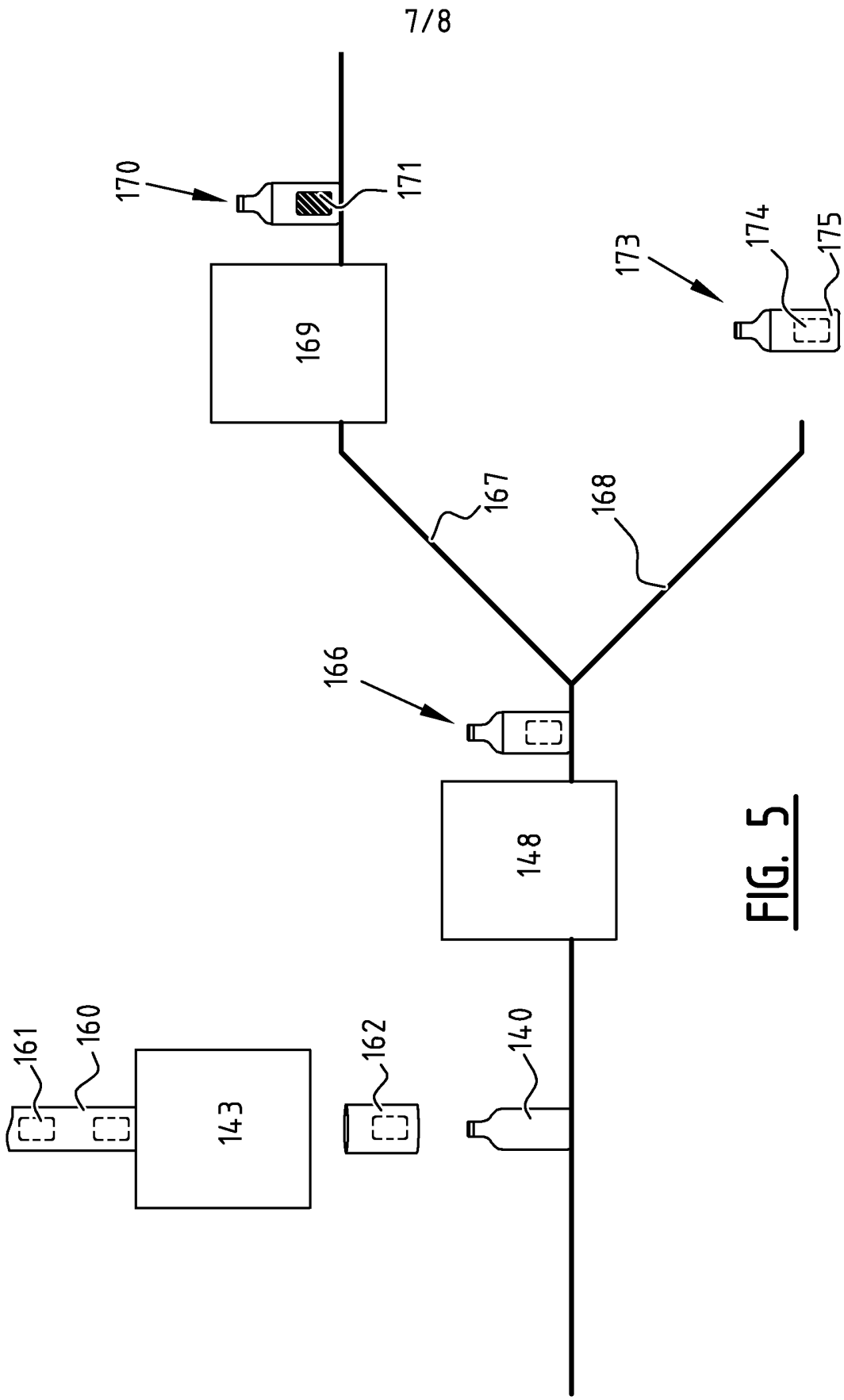


FIG. 5

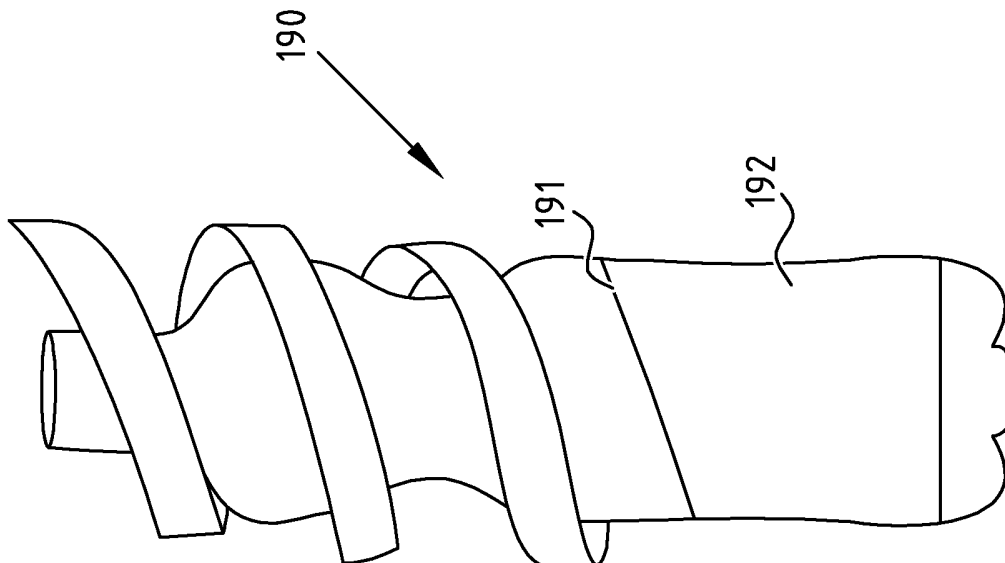


FIG. 8

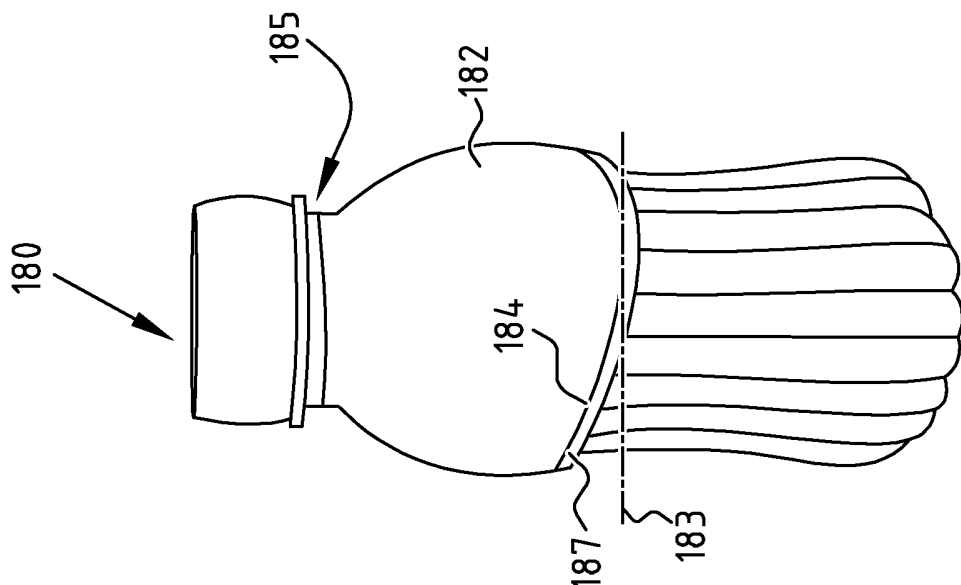


FIG. 7

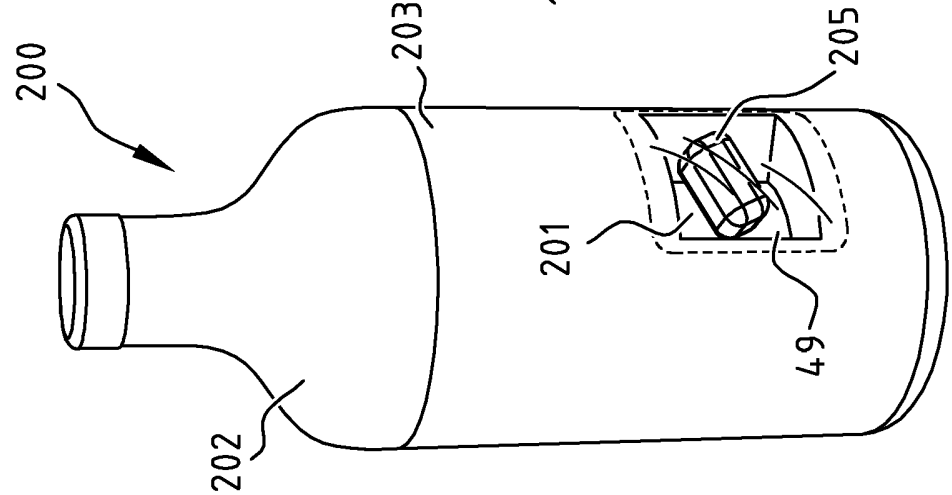


FIG. 6

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE 3Z/2LO988/CAR/4
Nederlands aanvraag nr. 2007730	Indieningsdatum 07-11-2011
	Ingeroepen voorrangdatum
Aanvrager (Naam) Fuji Seal Europe B.V.	
Datum van het verzoek voor een onderzoek van internationaal type 24-12-2011	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN 57415
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC) B65C3/06	
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC8	B65C B29C B65B
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. <input type="checkbox"/>	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)
IV. <input type="checkbox"/>	GEBREK AAN EENHEID (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 2007730

A. CLASSIFICATIE VAN HET ONDERWERP
INV. B65C3/06
ADD.

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

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
B65C B29C 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

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	EP 2 374 603 A1 (SOREMARTEC SA [BE]; FERRERO SPA [IT]; FERRERO OHG [DE]) 12 oktober 2011 (2011-10-12)	1
A	* alineas [0026] - [0028], [0035], [0051], [0056]; figuren 1-7 *	15
A	WO 02/26416 A1 (NOVOCAN AG [CH]; HAGMANN JAKOB [CH]) 4 april 2002 (2002-04-04) * bladzijde 15, regel 30 - bladzijde 16, regel 35; figuren 5,6,8 *	1,15
A	WO 94/14605 A1 (NEDBLAKE GRAYDON WESLEY [US]; GARBER JOHN [US]) 7 juli 1994 (1994-07-07) * samenvatting *; figuren 1-6 *	1,15
	----- -/--	

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 juli 2012

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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De bevoegde ambtenaar

Wartenhorst, Frank

**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 2007730

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
A	WO 2008/132805 A1 (FUJI SEAL INT INC [JP]; FUJIO MASAACKI [JP]; ARIMA KOJI [JP]; SAWAMURA) 6 november 2008 (2008-11-06) * samenvatting *; figuren 1,2 * -----	1,15
A	US 4 100 841 A (AMBERG STEPHEN W) 18 juli 1978 (1978-07-18) * kolom 16, regel 5 - regel 42; figuren 24-26,30 * -----	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 2007730

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
EP 2374603	A1	12-10-2011	CN 102248673 A 23-11-2011
			EP 2374603 A1 12-10-2011
			US 2011240588 A1 06-10-2011

WO 0226416	A1	04-04-2002	AU 8982801 A 08-04-2002
			CA 2423263 A1 24-03-2003
			CN 1478002 A 25-02-2004
			EP 1201331 A1 02-05-2002
			JP 2004509766 A 02-04-2004
			US 2004011113 A1 22-01-2004
			WO 0226416 A1 04-04-2002
			ZA 200302334 A 22-04-2004

WO 9414605	A1	07-07-1994	AU 5853994 A 19-07-1994
			CA 2152606 A1 07-07-1994
			EP 0675802 A1 11-10-1995
			US 5421933 A 06-06-1995
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**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 2007730

In het rapport genoemd octrooigescrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie



Agentschap NL
Ministerie van Economische Zaken,
Landbouw en Innovatie

WRITTEN OPINION

File No. SN57415	Filing date (day/month/year) 07.11.2011	Priority date (day/month/year)	Application No. NL2007730
International Patent Classification (IPC) INV. B65C3/06			
Applicant Fuji Seal Europe 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 Wartenhorst, Frank
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WRITTEN OPINION

Application number

NL2007730

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	2-25
	No: Claims	1
Inventive step	Yes: Claims	2-25
	No: Claims	1
Industrial applicability	Yes: Claims	1-25
	No: Claims	

2. Citations and explanations

see separate sheet

WRITTEN OPINION

Application number
NL2007730

Box No. VII Certain defects in the application

see separate sheet

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 document:

D1 EP 2 374 603 A1 (SOREMARTEC SA [BE]; FERRERO SPA [IT];
 FERRERO OHG [DE]) 12 oktober 2011 (2011-10-12)

1 Independent claim 1

1.1 The present application does not meet the criteria of patentability, because the subject-matter of claim 1 is not new.

1.2 Document **D1** discloses [references apply to this document]:

 Method for forming sleeved containers comprising,

 - conveying (208) a row of containers (10),

 - arranging sleeves (16) around the containers being conveyed,

 - attaching the sleeve to the container being conveyed by heat shrinking (214, 220), wherein the method further comprises removing (200) a part (202) of the sleeve (figures 1-3).

2 Independent claim 15

2.1 Document **D1** is regarded as being the prior art closest to the subject-matter of claim 1, and discloses [references apply to this document]:

 System for forming sleeved containers comprising a conveyor (208) for transporting a row of containers (10), a sleeving unit for arranging sleeves (16) around containers, the sleeving unit arranged to cooperate with the conveyor, a heat oven (220) for attaching the sleeve around the container by heat shrinking, the conveyor arranged through the heat oven downstream from the sleeving unit, wherein the system further comprises a removal unit (200) for removing a part (202) of the sleeve.

2.2 The subject-matter of claim 1 therefore differs from this known system for forming sleeved containers in that:

the removal unit is arranged along the conveyor downstream from the heat oven.

2.3 The subject-matter of claim 1 is therefore new.

2.4 The problem to be solved by the present invention may be regarded as:
enabling the application of differently shaped labels, e.g. having a curved end, while avoiding disturbances caused by the non-uniform shrinkage process.

2.5 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step for the following reasons:

By removing the part of the sleeve after the heat shrinking, the disturbances caused by the heat shrinking can be removed from the label and/or a curved ending can therewith be obtained.

3 **Dependent claims**

3.1 The combination of the features of the dependent claims, is neither known from, nor rendered obvious by, the available prior art.

Re Item VII

Certain defects in the application

4 **Two-part form**

Independent claims 1 and 15 are not in the two-part form, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble and the remaining features being included in the characterising part.

5 **Reference signs**

The features of claims 1-25 are not provided with reference signs placed in parentheses.

6 Prior art

The relevant background art disclosed in **D1** is not mentioned in the description, nor is this document identified therein.
