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(54) **BEVERAGE BOTTLING PLANT FOR  
FILLING BEVERAGE BOTTLES WITH A  
LIQUID BEVERAGE, WITH AN  
INFORMATION ADDING ARRANGEMENT  
FOR ADDING INFORMATION RELATING  
TO THE BEVERAGE BOTTLES, AND A  
METHOD OF OPERATING THE BEVERAGE  
BOTTLING PLANT**

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(57) **ABSTRACT**

A beverage bottling plant for filling beverage bottles with a liquid beverage, with an information adding arrangement for adding information relating to the beverage bottles, and a method of operating the beverage bottling plant. The abstract of the disclosure is submitted herewith as required by 37 C.F.R. §1.72(b). As stated in 37 C.F.R. §1.72(b): A brief abstract of the technical disclosure in the specification must commence on a separate sheet, preferably following the claims, under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims. Therefore, any statements made relating to the abstract are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

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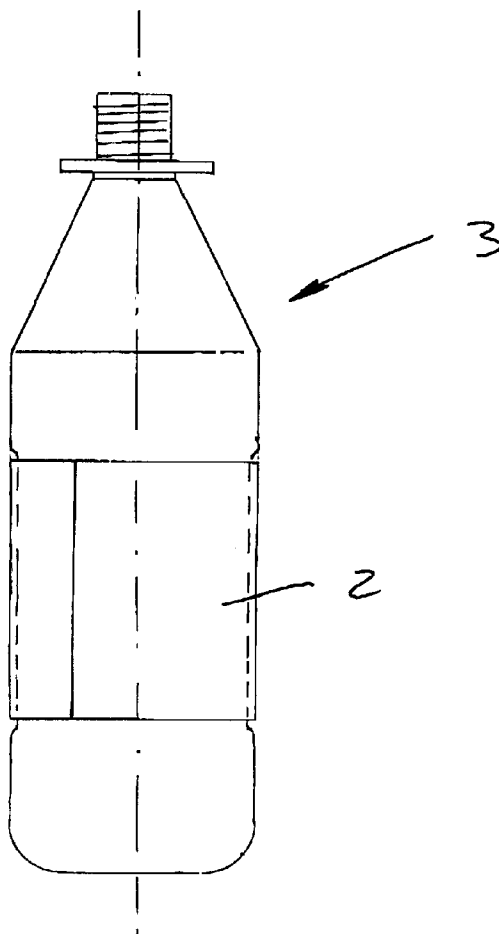
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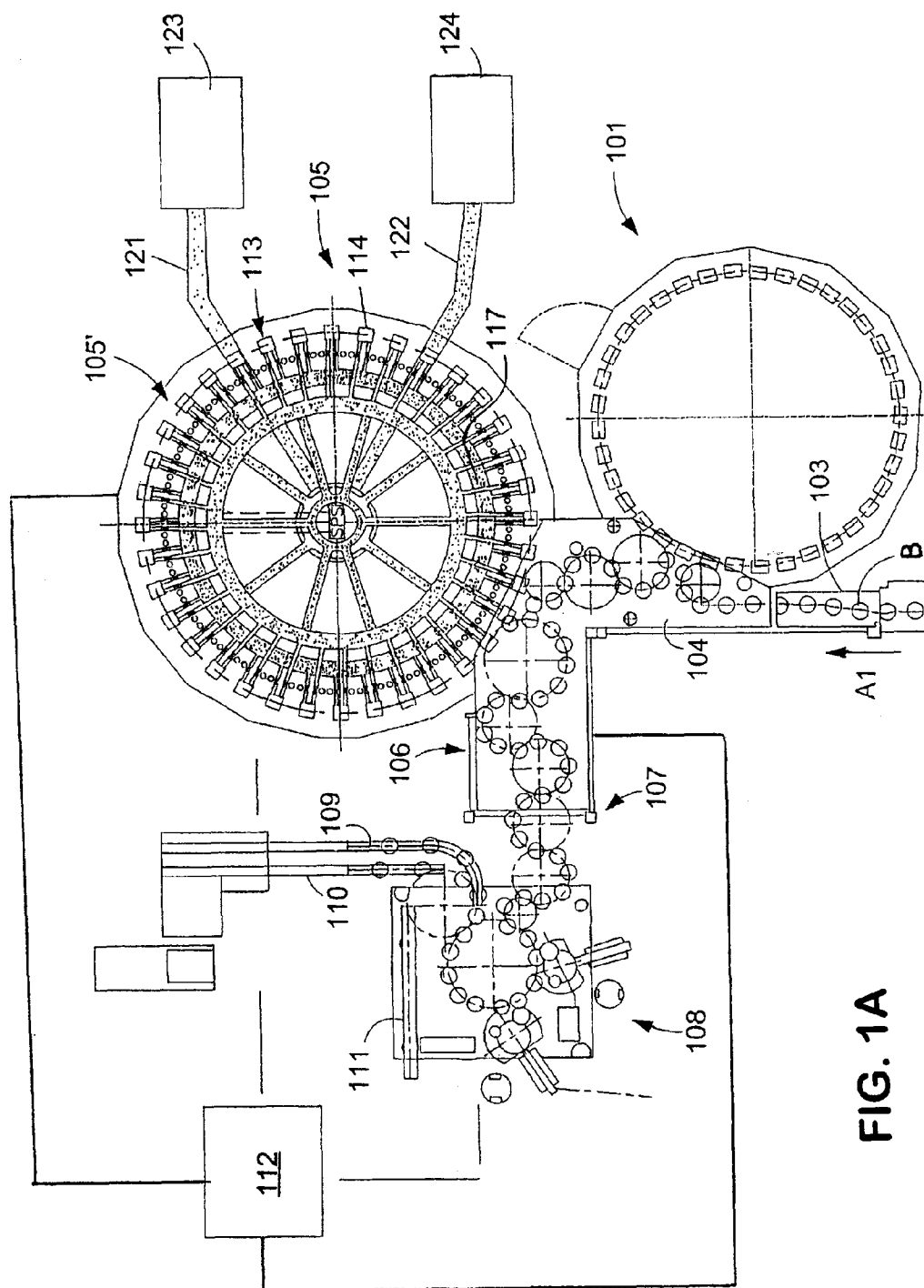


FIG. 1A

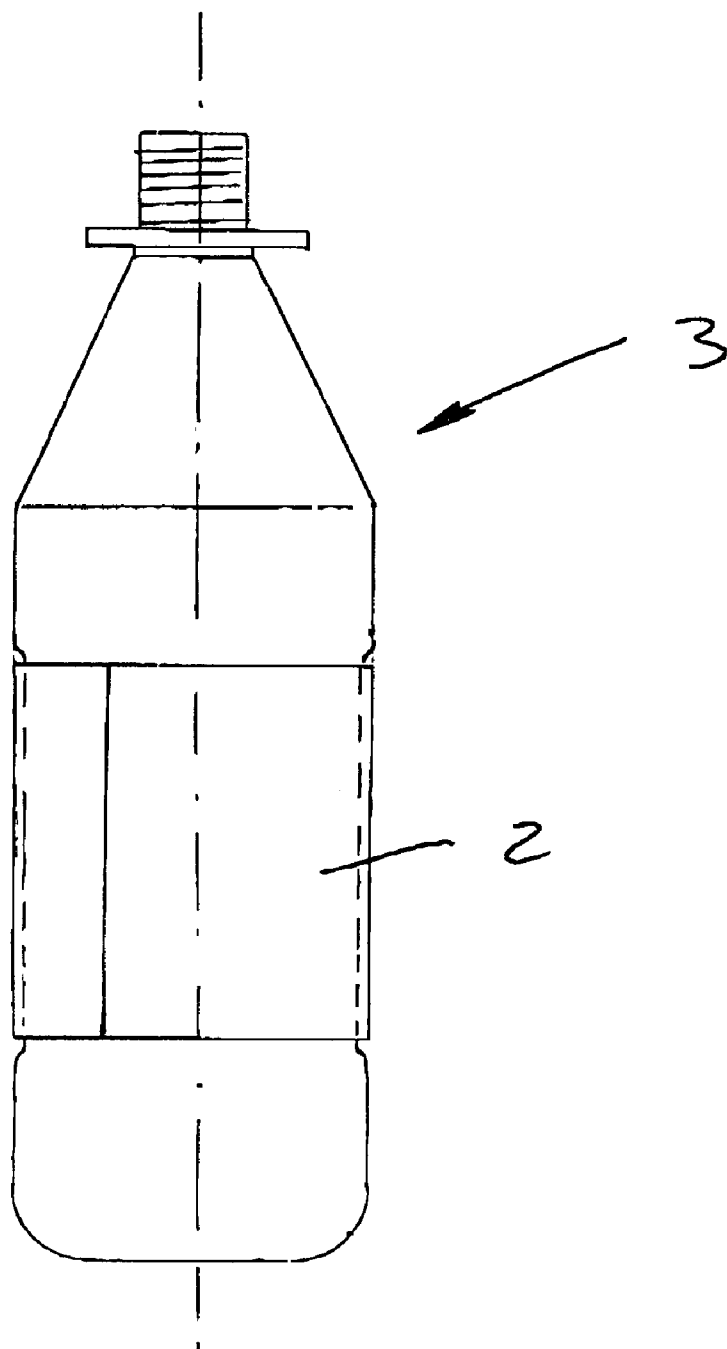


FIG. 1

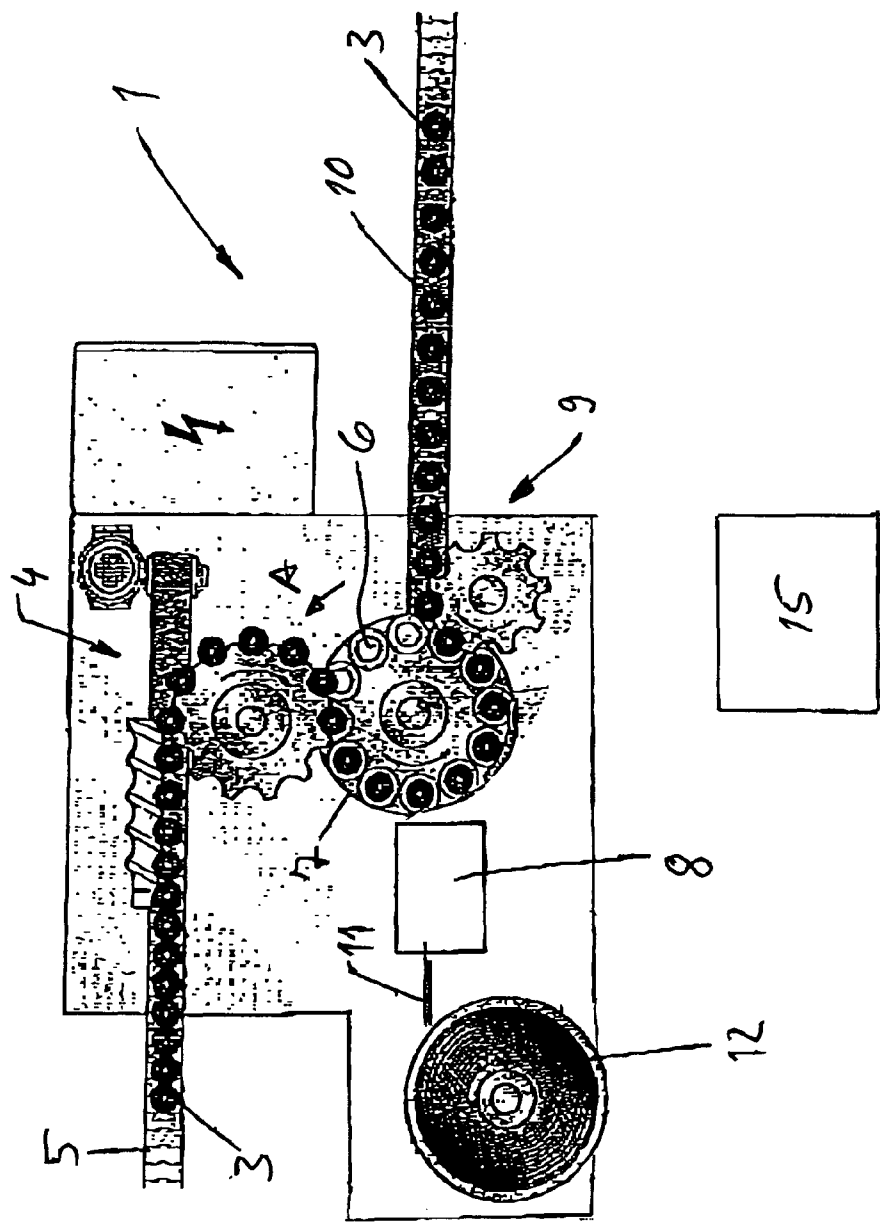


FIG. 2

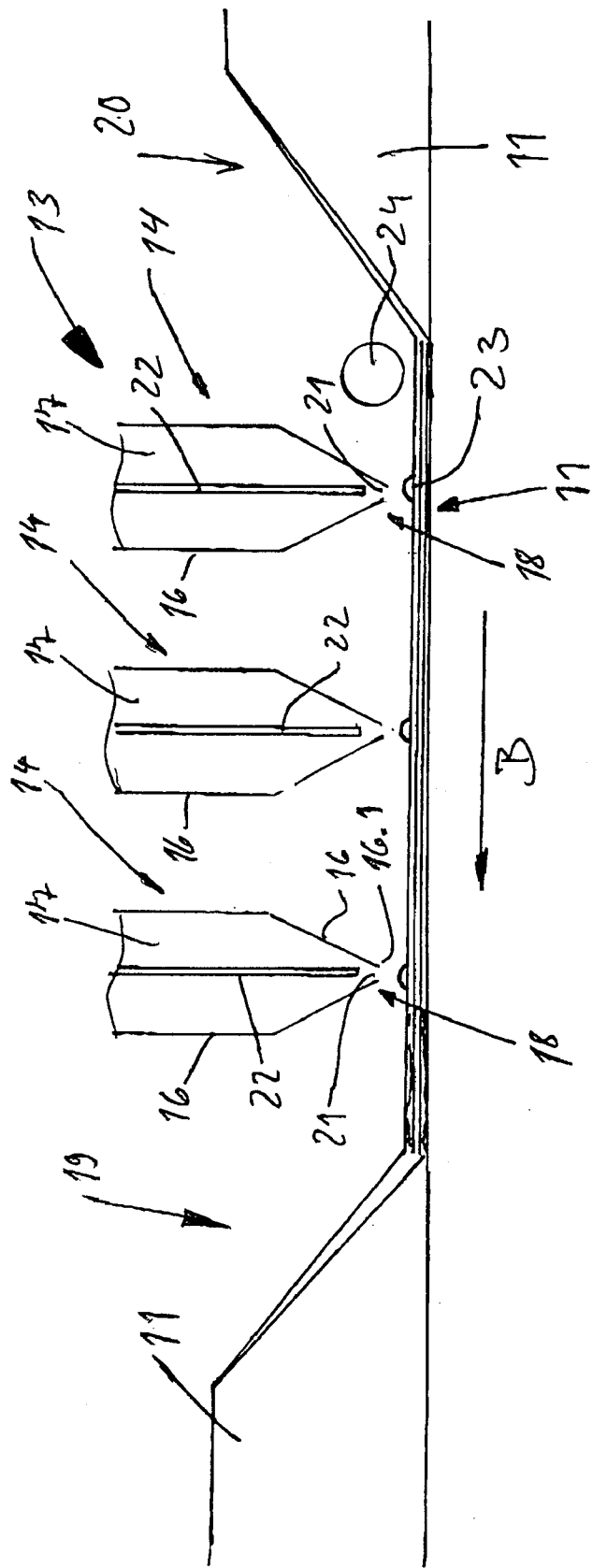
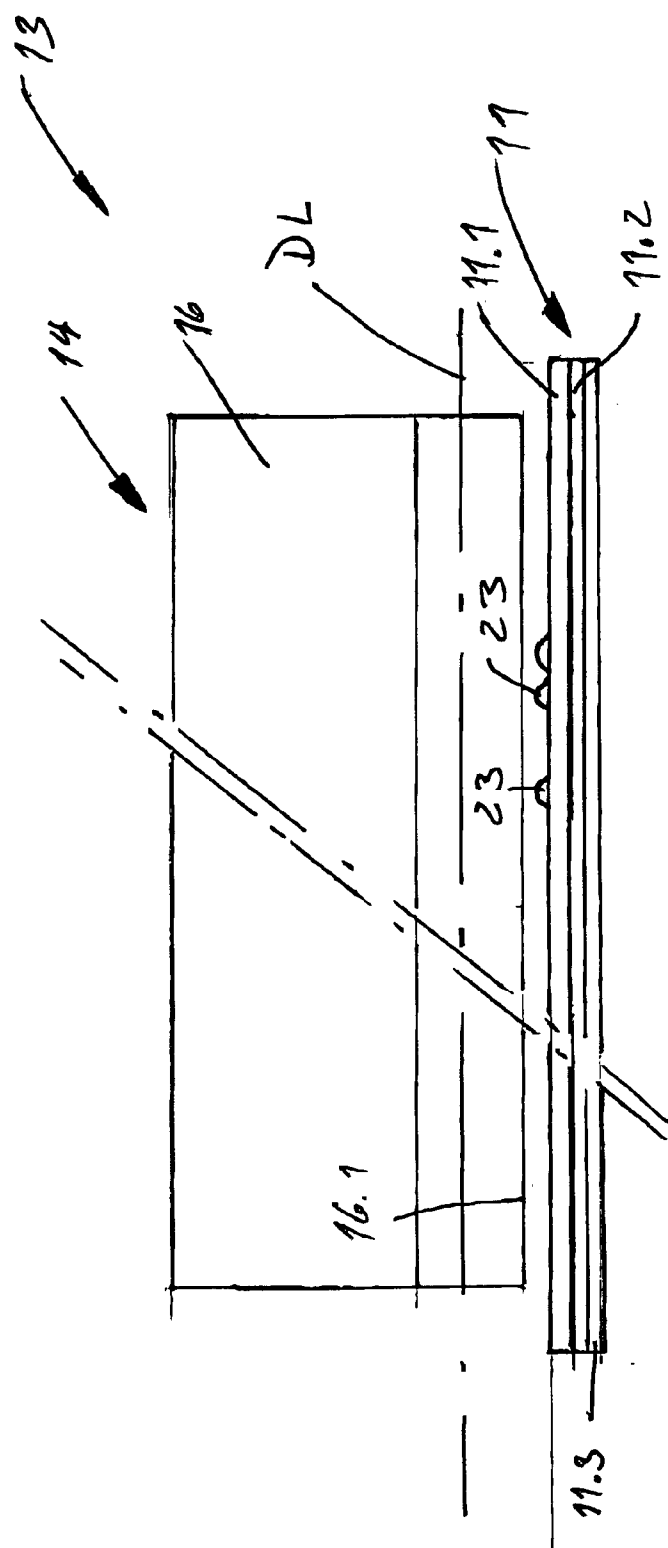
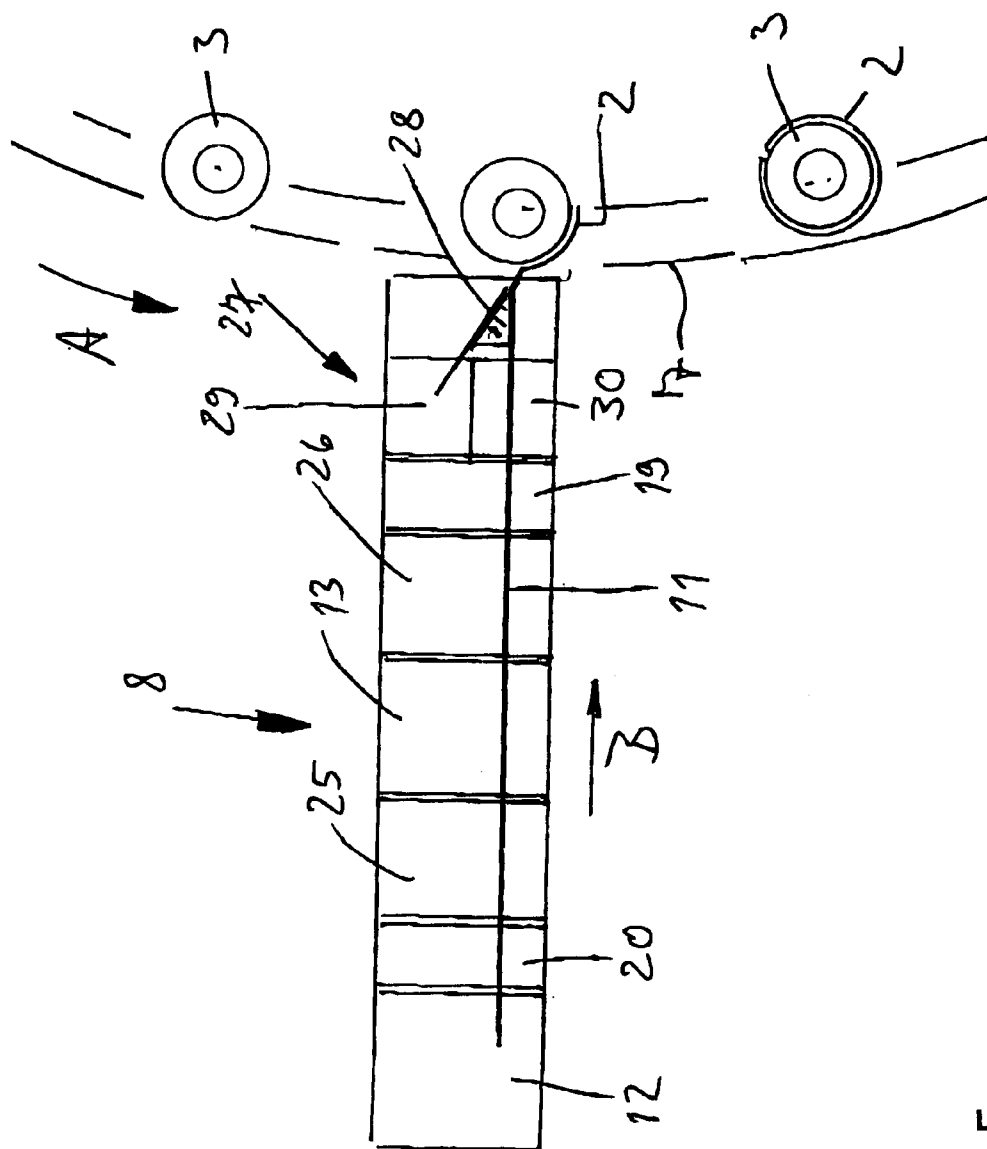


FIG. 3



**FIG. 4**



# FIG. 5

**BEVERAGE BOTTLING PLANT FOR FILLING  
BEVERAGE BOTTLES WITH A LIQUID  
BEVERAGE, WITH AN INFORMATION ADDING  
ARRANGEMENT FOR ADDING INFORMATION  
RELATING TO THE BEVERAGE BOTTLES, AND  
A METHOD OF OPERATING THE BEVERAGE  
BOTTLING PLANT**

**BACKGROUND**

**[0001]** 1. Technical Field

**[0002]** This application relates to a beverage bottling plant for filling beverage bottles with a liquid beverage, with an information adding arrangement for adding information relating to the beverage bottles, and a method of operating the beverage bottling plant.

**[0003]** 2. Background Information

**[0004]** A beverage bottling plant for filling bottles with a liquid beverage filling material can possibly comprise a beverage filling machine, which is often a rotary filling machine, with a plurality of beverage filling positions, each beverage filling position having a beverage filling device for filling bottles with liquid beverage filling material. The filling devices may have an apparatus designed to introduce a predetermined volume of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material.

**[0005]** Some beverage bottling plants may possibly comprise filling arrangements that receive a liquid beverage material from a toroidal or annular vessel, in which a supply of liquid beverage material is stored under pressure by a gas. The toroidal vessel may also be connected to at least one external reservoir or supply of liquid beverage material by a conduit or supply line. In some circumstances it may even be possible that a beverage bottling plant has two external supply reservoirs, each of which may be configured to store either the same liquid beverage product or different products. These reservoirs could possibly be connected to the toroidal or annular vessel by corresponding supply lines, conduits, or other arrangements. It is also possible that the external supply reservoirs could be in the form of simple storage tanks, or in the form of liquid beverage product mixers.

**[0006]** A wide variety of types of filling elements are used in filling machines in beverage bottling or container filling plants for dispensing a liquid product into bottles, cans or similar containers, including but not limited to filling processes that are carried out under counterpressure for the bottling of carbonated beverages. The apparatus designed to introduce a predetermined flow of liquid beverage filling material further comprises an apparatus that is designed to terminate the filling of the beverage bottles upon the liquid beverage filling material reaching the predetermined level in bottles. There may also be provided a conveyer arrangement that is designed to move bottles, for example, from an inspecting machine to the filling machine.

**[0007]** After a filling process has been completed, the filled beverage bottles are transported or conveyed to a closing machine, which is often a rotary closing machine. A revolving or rotary machine comprises a rotor, which revolves around a central, vertical machine axis. There may further be provided a conveyer arrangement configured to

transfer filled bottles from the filling machine to the closing station. A transporting or conveying arrangement can utilize transport star wheels as well as linear conveyors. A closing machine closes bottles by applying a closure, such as a screw-top cap or a bottle cork, to a corresponding bottle mouth. Closed bottles are then usually conveyed to an information adding arrangement, wherein information, such as a product name or a manufacturer's information or logo, is applied to a bottle. A closing station and information adding arrangement may be connected by a corresponding conveyer arrangement. Bottles are then sorted and packaged for shipment out of the plant.

**[0008]** Many beverage bottling plants may also possibly comprise a rinsing arrangement or rinsing station to which new, non-return and/or even return bottles are fed, prior to being filled, by a conveyer arrangement, which can be a linear conveyor or a combination of a linear conveyor and a starwheel. Downstream of the rinsing arrangement or rinsing station, in the direction of travel, rinsed bottles are then transported to the beverage filling machine by a second conveyer arrangement that is formed, for example, by one or more starwheels that introduce bottles into the beverage filling machine.

**[0009]** It is a further possibility that a beverage bottling plant for filling bottles with a liquid beverage filling material can be controlled by a central control arrangement, which could be, for example, a computerized control system that monitors and controls the operation of the various stations and mechanisms of the beverage bottling plant.

**[0010]** In the context of labeling bottles or similar containers, there are existing methods and devices in which, in a first process step, containers are provided with a label or are imprinted by means of a conventional printing process, for example using a screen-printing process or pad printing. In these cases, labeling containers can be changed only by replacing mechanical print masks or formats that are used for direct printing of containers or by replacing labels or labeling material used, which at the very minimum is time-consuming and in any case is generally not possible while printing or labeling machine is in operation.

**[0011]** In a second step, after printing or labeling, containers can be provided with simple information that can differ from container to container, such as differing serial numbers; from container group to container group, such as differing batch numbers; or from day to day production dates.

**[0012]** There is an existing print head which is intended for printing on flat printing stock and with which a plurality of printed dots can be produced tight up against another or at a very small distance from one another in a line, for example at least 150 dots per inch, on a surface to be printed, and specifically by a plurality of individually activated individual ink jets. The active print width of this print head, which is also known by the name "Tonejet", is a function only of the capacity and performance of the computer that actuates the print head. For example, print heads from 1.7 to 6.8 inch print width, corresponding to a 256 Bit control or a 1024 Bit control, can thereby be produced. Using this print head, it is possible to print a two-dimensional impression with a sufficiently large surface area only in a single axial direction by relative motion between a surface to be printed and a print head.



## OBJECT OR OBJECTS

[0013] An object of at least one possible embodiment is to create a device for the application of information and/or images onto container surfaces that is as mechanically simple as possible, is as little susceptible to disruption as possible and can be operated at a high output capacity, whereby the orientation of the information can be selected as desired with respect to the geometry of the container. Another object of at least one possible embodiment of the present application is to describe a method and a device with which it is possible to provide bottles or similar containers efficiently with labels of different sizes and formats or containing different information.

## SUMMARY

[0014] At least one possible embodiment teaches that the containers and the device to apply information to the containers are realized so that they can be moved in relation to each other.

[0015] Another possible embodiment teaches a method and a device for labeling bottles or similar containers with labels produced by printing from a label primary material and using at least one labeling station past which containers move on a conveyor element, and labels are attached to containers.

[0016] One feature of a method realized in at least one possible embodiment of the present application is that the information that is initially essential for the overall appearance of labels, and at least a significant portion of the label design and printing of labels that forms this part of the packaging design, is printed before labeling. In at least one example, this process occurs before the application of labels to containers in a labeling station or in a printing unit in a labeling station on raw material or primary material of labels. Printing labels thus takes place in a labeling station immediately or essentially immediately prior to labeling. That feature alone makes it possible, using one and the same label primary material to modify a label design or content by a corresponding adjustment or conversion of a printing unit.

[0017] In at least one possible embodiment of the present application, a printing unit is realized so that individual printed images are produced on labeling primary material as a function of an actuation by an electronic control unit or a computer, and specifically according to a print mask that is formed by an electronic control unit or by computer software from a data set, and is stored for example in a memory of a control device or of a computer. By modifying this software printing mask, it becomes possible to easily modify or convert a label design, and specifically with regard to all its aspects, including but not limited to text, graphics and colors, as well as size and shape of label printing. At least one possible embodiment of the present application therefore offers the capability, among other things, to modify and/or update individual label designs easily, and also as a function of specific containers to be labeled or products contained in these containers. It is also possible to select and use label designs required for a product for printing label primary material, to select sizes of individually-printed labels to match sizes and/or diameters of containers to be labeled, and/or to modify label designs or parts of label designs while a labeling process is in operation.

[0018] A print head may conceivably have at least one print head, which may be realized in a Tonejet print head or a print head that corresponds to such a Tonejet print head. A print head of this type has a printing area which, during printing, is at a short distance from and faces a surface to be printed, a plurality of individual nozzles which are provided one behind another at very close intervals in a longitudinal axis of the print head, and each nozzle may be formed by a nozzle opening and by at least one electrode associated with each individual nozzle. In at least one possible embodiment, printing ink in a print head may discharge from each individual nozzle or a corresponding nozzle opening only if, during activation of an individual nozzle, the electrode associated with the individual nozzle is actuated by an electrical voltage, the polarity and/or potential of which differs from the polarity and/or the potential of the print head or of the ink in the print head, so that as a result of electrostatic forces, a defined quantity of ink is ejected or discharged from the nozzle opening of the activated individual nozzle. A print head of this type is also called an "electrostatic print head" below.

[0019] Containers within the meaning of the present application include but are not limited to bottles, cans or packages, whereby all containers can have a cylindrical, non-cylindrical, rotationally symmetrical or a shape and/or peripheral surface that is not rotationally symmetrical.

[0020] The labeling primary material used with at least one possible embodiment is, for example, an endless or strip-format label primary material. Basically, single-sheet label primary material can also be used in at least one possible embodiment, and specifically so that it corresponds to the realization of the labeling station and/or of the printing unit in the labeling station. Developments of at least one possible embodiment of the present application are described herein.

[0021] This application relates to a device for the application of information and/or images onto the external surface of containers. One possible embodiment of the present application may be realized in a method and a device for labeling bottles or similar containers with labels produced by printing from a label primary material and using at least one labeling station past which containers move on a conveyor element, and labels are attached to containers.

[0022] The above-discussed embodiments of the present invention will be described further hereinbelow. When the word "invention" or "embodiment of the invention" is used in this specification, the word "invention" or "embodiment of the invention" includes "inventions" or "embodiments of the invention", that is the plural of "invention" or "embodiment of the invention". By stating "invention" or "embodiment of the invention", the Applicant does not in any way admit that the present application does not include more than one patentably and non-obviously distinct invention, and maintains that this application may include more than one patentably and non-obviously distinct invention. The Applicant hereby asserts that the disclosure of this application may include more than one invention, and, in the event that there is more than one invention, that these inventions may be patentable and non-obvious one with respect to the other.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0023] At least one possible embodiment is explained in greater detail below with reference to the exemplary embodiments that are illustrated in the accompanying figures. In the figures:

[0024] FIG. 1A shows schematically the main components of one possible embodiment example of what may be a typical system for filling containers;

[0025] FIG. 1 shows a container in the form of a bottle provided with a label;

[0026] FIG. 2 is a schematic illustration from overhead of a labeling machine of a rotary construction claimed by the invention with a labeling station that has electrostatic print heads;

[0027] FIG. 3 is a schematic illustration of the electrostatic print heads of a printing unit of the labeling station in partial section, together with the label primary material to be printed;

[0028] FIG. 4 shows one of the print heads of the print unit illustrated in FIG. 3; and

[0029] FIG. 5 is a schematic functional diagram of the function elements of the labeling station.

## DESCRIPTION OF EMBODIMENT OR EMBODIMENTS

[0030] Developments, advantages and potential applications of at least one possible embodiment will become apparent on the basis of the following description of the exemplary embodiments and of the accompanying drawing. All the characteristics described and/or illustrated are the object or objects of the invention, individually or in any possible combination, regardless of their placement in the claims or the references between claims. The text of the claims is simultaneously incorporated by reference into the description.

[0031] FIG. 1A shows schematically the main components of one possible embodiment example of what may be a typical system for filling containers, specifically, a beverage bottling plant for filling bottles B with at least one liquid beverage, in accordance with at least one possible embodiment, in which system or plant could possibly be utilized at least one aspect, or several aspects, of the embodiments disclosed herein.

[0032] FIG. 1A shows a rinsing arrangement or rinsing station 101, to which the containers, namely bottles B, are fed in the direction of travel as indicated by the arrow A1, by a first conveyer arrangement 103, which can be a linear conveyer or a combination of a linear conveyer and a starwheel. Downstream of the rinsing arrangement or rinsing station 101, in the direction of travel as indicated by the arrow A1, the rinsed bottles B are transported to a beverage filling machine 105 by a second conveyer arrangement 104 that is formed, for example, by one or more starwheels that introduce bottles B into the beverage filling machine 105.

[0033] The beverage filling machine 105 shown is of a revolving or rotary design, with a rotor 105', which revolves around a central, vertical machine axis. The rotor 105' is designed to receive and hold the bottles B for filling at a plurality of filling positions 113 located about the periphery

of the rotor 105'. At each of the filling positions 103 is located a filling arrangement 114 having at least one filling device, element, apparatus, or valve. The filling arrangements 114 are designed to introduce a predetermined volume or amount of liquid beverage into the interior of the bottles B to a predetermined or desired level.

[0034] The filling arrangements 114 receive the liquid beverage material from a toroidal or annular vessel 117, in which a supply of liquid beverage material is stored under pressure by a gas. The toroidal vessel 117 is a component, for example, of the revolving rotor 105'. The toroidal vessel 117 can be connected by means of a rotary coupling or a coupling that permits rotation. The toroidal vessel 117 is also connected to at least one external reservoir or supply of liquid beverage material by a conduit or supply line. In the embodiment shown in FIG. 1A, there are two external supply reservoirs 123 and 124, each of which is configured to store either the same liquid beverage product or different products. These reservoirs 123, 124 are connected to the toroidal or annular vessel 117 by corresponding supply lines, conduits, or arrangements 121 and 122. The external supply reservoirs 123, 124 could be in the form of simple storage tanks, or in the form of liquid beverage product mixers, in at least one possible embodiment.

[0035] As well as the more typical filling machines having one toroidal vessel, it is possible that in at least one possible embodiment there could be a second toroidal or annular vessel which contains a second product. In this case, each filling arrangement 114 could be connected by separate connections to each of the two toroidal vessels and have two individually-controllable fluid or control valves, so that in each bottle B, the first product or the second product can be filled by means of an appropriate control of the filling product or fluid valves.

[0036] Downstream of the beverage filling machine 105, in the direction of travel of the bottles B, there can be a beverage bottle closing arrangement or closing station 106 which closes or caps the bottles B. The beverage bottle closing arrangement or closing station 106 can be connected by a third conveyer arrangement 107 to a beverage bottle labeling arrangement or labeling station 108. The third conveyer arrangement may be formed, for example, by a plurality of starwheels, or may also include a linear conveyer device.

[0037] In the illustrated embodiment, the beverage bottle labeling arrangement or labeling station 108 has at least one labeling unit, device, or module, for applying labels to bottles B. In the embodiment shown, the labeling arrangement 108 is connected by a starwheel conveyer structure to three output conveyer arrangements: a first output conveyer arrangement 109, a second output conveyer arrangement 110, and a third output conveyer arrangement 111, all of which convey filled, closed, and labeled bottles B to different locations.

[0038] The first output conveyer arrangement 109, in the embodiment shown, is designed to convey bottles B that are filled with a first type of liquid beverage supplied by, for example, the supply reservoir 123. The second output conveyer arrangement 110, in the embodiment shown, is designed to convey bottles B that are filled with a second type of liquid beverage supplied by, for example, the supply reservoir 124. The third output conveyer arrangement 111, in

the embodiment shown, is designed to convey incorrectly labeled bottles B. To further explain, the labeling arrangement 108 can comprise at least one beverage bottle inspection or monitoring device that inspects or monitors the location of labels on the bottles B to determine if the labels have been correctly placed or aligned on the bottles B. The third output conveyor arrangement 111 removes any bottles B which have been incorrectly labeled as determined by the inspecting device.

[0039] In the figures, a labeling machine 1 is shown for the application of labels 2 on containers, in the form of bottles 3 standing in the upright position, which are fed to the labeling machine 1 or to a container inlet 4 on a conveyor 5. The labeling machine can be both a labeling machine that is constructed that employs a rotary design or a labeling machine that employs a linear design. For purposes of simplification, the description presented below—without restricting the object of the invention to this specific description—relates only to labeling machines that employ a rotary construction. The bottles 3 in a container receptacle 6 are transferred to a rotor that is driven so that it rotates around a vertical machine axis in the direction indicated by the arrow A and for the labeling moves with the rotor 6 past a labeling station which in FIG. 1 is designated 8 in general. The labeled bottles 3 are then transferred at a container outlet 9 to a conveyor 10 and fed by the conveyor to the next application.

[0040] In the illustrated embodiment, labels 2 are realized in the form of self-adhesive labels and are each formed by separating them from an endless strip of label primary material 11 which is realized in the manner of the prior art in at least three layers, and specifically as illustrated in FIGS. 3 and 4 with a layer 11.1 that forms the ultimate label 2 and is made of a suitable label primary material, with a self-adhesive layer 11.2 and with a removable cover layer 11.3, made of silicon paper, for example. The label primary material 11 is available in the form of a stock that is stored in a buffer 12 in the form of a supply spool 12. In the illustrated embodiment, labels 2 are realized in the form of labels that encircle the bottles to which they are to be applied.

[0041] One feature of the labeling station 8 is that the label primary material 11 or the segments of the label primary material 11 that after they are separated form labels are printed only in the labeling station 8 and immediately or essentially immediately before they are applied to the bottles 3 on a printing unit 13, using print heads 14. The print heads 14 are digitally actuated by an electronic control device 15, such as in the form of a computer, in which the image, comprising label text and/or graphic information, to be produced by the respective print head 14 is stored.

[0042] The printing of the label primary material in the printing unit 13 occurs, for example, such that the impression and/or the graphic and/or color design or text and graphics of the individual label 2 is produced completely by the printing unit 13 on the neutral label primary material 11, and/or an impression that is already present on the label primary material 11 is supplemented with this printing unit 13, for example by the addition of text, color and/or graphics, as desired. Because the label primary material 11 is printed only in the labeling station 8, such as immediately or essentially immediately prior to the labeling of the bottles 3,

and because of the actuation of the printing unit 13 and of the print heads 14 provided in it by the electronic control unit 15, using digital print masks and forms that are stored digitally or in data form, various advantageous capabilities are created, i.e. among other things the ability to quickly convert the labeling machine 1 for use with different products, to adjust or adapt the size of labels 2 or of the lengths of material separated from the label primary material that form labels to different bottle diameters etc. Changing the label design, i.e. the impression on labels 2, also requires only a reprogramming or a modification of the programming of the electronic control device 15. It is possible to change the label design or parts thereof while the labeling process is running, for example to reconfigure the printed image for each bottle 3 to be labeled, among other things, so that the design or the printed image for each label is a combination of a constant component and variable contents or information. Variable content of this type can be, for example, graphic information or representations and/or changing color designs and/or varying printed information. As a result, it is then also possible to provide labels 2, while retaining a single basic shape or form of label design, with graphic images of different persons, such as players on favorite sports teams such as football teams, for example. The varying information can also be numerical or alphanumeric information, for example, for the addition of information relating to the production date and/or the “best if consumed by” date, or in the form of a numerical code.

[0043] At least one possible embodiment relates to the application of cutting marks. These marks are important in particular if the label primary material is designed to be cut into individual labels by a cutting process, whereby the cutting process is triggered by the optical detection of a corresponding cutting mark on the strip of labels.

[0044] In this realization, labels 2 are applied to the bottles 3 in the conventional form, such as in the transfer position of the labeling station 8, after the removal of the cover layer 11.3, the self-adhesive label primary material 11 is applied to the bottle 3 that is being moved past, and then the length of material that is removed from the label primary material 11 and that forms the label 2 is applied in its entirety to the outside surface of the bottle 3 while the bottle 1 is rotated.

[0045] To achieve the highest possible or at least very substantial throughput of the number of bottles printed per unit of time and an optimum print quality, in the illustrated exemplary embodiment the print heads 14 are realized in the form of electrostatic print heads. To make possible multiple-color printing, there are three print heads 14, each of which is used to print one color set of the multiple-color printing. Therefore the print heads 14 contain different inks (e.g. red, blue and yellow). Basically, it is also possible to provide additional print heads 14 on the printing unit 13, for example a fourth print head 14 for black ink.

[0046] As FIGS. 3 and 4 show, each print head 14 comprises a housing 16 which forms, among other things, an enclosed interior housing cavity 17 that holds a liquid or viscous ink. The housing 16 is realized so that its interior cavity 17 tapers toward a lower housing segment 16.1 in the shape of a funnel or wedge. On this housing segment 16.1, which extends over the entire length of the housing 16 and is oriented parallel or essentially parallel to a longitudinal axis DL of the housing or print head, there are a plurality of

individually actuated individual nozzles **18** for the controlled discharge of the ink, and specifically arranged in at least one row, one behind another in the direction of the longitudinal axis DL of the print head and very close together, so that, for example, 150 or more individual nozzles **18** per inch can be formed on the housing segment **16.1**.

[0047] With the housing segment **16.1** that has the individual nozzles **18**, each print head **14** is located at a short, specified distance above the label primary material **11** to be printed, which is moved in a continuous or essentially continuous or timed movement past the print heads **14** oriented in a horizontal plane as indicated by the arrow B in FIG. 2, whereby this transport or forward-feed direction B is oriented at a right angle, perpendicular or essentially perpendicular to the print head longitudinal axis DL of the print heads **14**. In the illustrated exemplary embodiment, the print heads **14** are arranged with their print head longitudinal axes DL in the horizontal direction and parallel or essentially parallel to one another, and also possibly in a common horizontal plane.

[0048] Because during the printing process the label primary material **11** is located horizontally below the print heads **14**, and for the transfer of labels **2** to the bottles **3** the label primary material **11** must be oriented in a vertical or essentially vertical plane, after the printing or also before the printing, the label primary material **11** is rotated or deflected as illustrated at **19** and **20** in FIGS. 3 and 5.

[0049] Each individual nozzle **18** comprises an opening **21** and a needle-shaped electrode **22** that is associated with this opening, which electrode is equi-axial with the axis of the respective opening and ends at a short distance from this opening inside the housing cavity **17**. Each print head **14** is also realized so that at least during the printing process, the ink contained in the housing interior **17** is applied with a certain hydrostatic pressure against the openings **21** of the individual nozzles **18**. However, the cross section of these openings is selected taking the viscosity and/or the surface tension of the ink into consideration so that when the individual nozzle **18** is not activated, ink does not exit the openings **21** in spite of the hydrostatic pressure.

[0050] The electrodes **22** can be actuated individually by means of the control device **15**, and specifically so that when the individual nozzle **18** is not actuated, the corresponding electrode **22** is at the same electrical potential as the ink in the housing interior **17**. When an individual nozzle **18** is activated, the voltage potential of the corresponding electrode **22** is modified by an appropriate activation briefly or in a pulsed manner so that via the opening **21**, ink is discharged to produce a dot **23** on the label primary material.

[0051] Because the print heads **14** with their print head longitudinal axis DL are oriented at right angles or perpendicular or essentially perpendicular to the longitudinal extension of the label primary material **11** or perpendicular or essentially perpendicular to the feed direction B, the ink is applied to the label primary material **11** in rows that run perpendicular or essentially perpendicular to the longitudinal extension of the label primary material **11** or to the feed direction B over the entire width of the area to be printed, and specifically progressively in the longitudinal direction or in the direction of movement of the label primary material **11**. The individual nozzles **18** can be activated at a high

speed. Furthermore, for the printing only a single relative movement between the label primary material **11** and the respective print head **14** is essentially necessary, namely only the feed motion of the label primary material **11**. It is therefore possible to achieve a high printing output. The respective image, as noted above, is generated purely digitally.

[0052] In at least one possible embodiment, the feed movement of the label primary material **11**, at least in the vicinity of the print heads **14**, is also regulated by the electronic control device **15**, and possibly synchronously with the actuation of the print heads **14**, to thereby achieve a clear image with high quality. In at least one possible embodiment, a centering and guide means for the label primary material **11** are provided in the vicinity of the print heads **14** to essentially optimally orient this material with reference to the print heads **14**, and/or in particular to accurately maintain the specified distance between the print heads **14** and the label primary material **11**.

[0053] To improve the printed impression produced by the print head **14**, in particular in terms of contrast and/or resolution, it may be appropriate to locate a corona element **24** in the feed direction B ahead of the print heads **14**, which corona element **24** runs with its longitudinal dimension parallel or essentially parallel to the plane of the label primary material **11** and is oriented at a right angle or perpendicular or essentially perpendicular to the feed direction B and with which the label primary material **11** is electrostatically charged on its side to be printed.

[0054] FIG. 5 shows again, in a function or block diagram, the essential elements of the labeling station **8**. As shown, in the feed or transport direction of the label primary material **12**, immediately or essentially immediately after the buffer **12**, is the deflector **20**, and downstream of that an optional preheater unit **25** to preheat the label primary material **11** before the printing in the printing unit **13**. Following the printing unit **13** is a dryer unit **26** in which, by heating, a final drying of the ink takes place, before the labeling primary material then travels via the additional deflector **19** to the dispenser unit **26**, at which the individual labels produced from the label primary material **11** are transferred to the bottles **3** that are moving past this dispenser unit or at the label transfer. For this purpose the dispenser unit is constructed in a manner that will be known by a technician specializing in labeling, with self-adhesive labels that are produced from a strip-shaped label primary material, in particular with a tear-off or folding edge **28** for the removal of the strip-shaped cover layer **11.3**, with a collecting unit **29** to receive the removed cover layer **1.3** and with a cutting device **30** for the separation of the individual label **2** from the strip-shaped label primary material **11**.

[0055] The optional preheater unit **25** accelerates the drying of the ink. In particular, the presence of the preheater also means that the ink of the individual ink sets formed by the print heads **14** dries inside the printing unit **13** at least to the point where an undesirable smearing or running of the different colors of ink occurs does not occur.

[0056] The invention was described above on the basis of one exemplary embodiment. It goes without saying that numerous modifications and variants are possible without thereby going beyond the teaching of the invention. For example, it is also possible to realize the labeling machine

**1** so that it can be used to process roll-feed labels or a label primary material that already has self-adhesive individual labels on a backing material. It is also possible to realize the labeling machine so that it can be used to process label primary material or individual labels that are affixed to the bottles **3** using glue, e.g. again in the form of encircling labels etc. When a non-self-adhesive label primary material of this type is used, or a single-sheet-format label primary material, the dispenser unit has, for example, in addition to the cutting device **30** a vacuum drum with which the separated label **2** is held until it is applied to the bottle in question.

[0057] In the above description, it was also assumed that the final drying of the ink takes place in the dryer unit **26** that is immediately downstream of the printing unit **13**. Basically it is also possible, instead of or in addition to the dryer unit **26**, to provide a dryer unit downstream of each printing head **14** in the feed direction B of the label primary material **11**.

[0058] When the ink is selected appropriately, the drying can also be accomplished in another manner, such as by UV light or infrared radiation, for example.

[0059] It is possible that at least one embodiment of the present application may include a printing device for the application of ink, resin-based pigments, and/or paint-like or enamel-like substances to a labeling material.

[0060] In a method for the labeling of bottles or similar containers with labels produced by printing from a label primary material, labels are printed in the labeling station by at least one printing unit located there before the application of labels to containers.

[0061] One feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in a method for the labeling of bottles **3** or similar containers with labels **2** produced by printing from a label primary material **11** and using at least one labeling station **8** past which containers **3** move on a conveyor element **7** and labels **2** are attached to containers, characterized in that labels **2** are printed by imprinting the label primary material **11** in the labeling station **8** using at least one printing unit **13** located there, before the application of labels **2** to containers.

[0062] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the label primary material **11** is pre-printed and that the image that is already present on the label primary material **11** is supplemented by the printing of the label primary material **11** in the labeling station **8**.

[0063] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the complete image on labels **2** is produced by the printing of the label primary material **11** in the labeling station **8**.

[0064] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the label primary material **11** is printed in a plurality of colors.

[0065] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to

possibly reside broadly in the method, characterized in that the printing of the label primary material **1** is performed using at least one printing unit **13** that produces the printed image as a function of an electronic actuation system **15**.

[0066] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the printing unit **13** produces the printed image as a function of print masks that are stored electronically or in the form of software in a control device **15**.

[0067] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the printed image is modified at least partly during a labeling process.

[0068] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the label primary material **11** is printed line-by-line at a right angle to the longitudinal direction of the label primary material, and specifically for example over its entire width or almost its entire width.

[0069] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the printing is done with a relative movement between the label primary material **11** and the printing unit **13** or at least one print head **14** of this printing unit **13**.

[0070] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the label primary material **11** is moved relative to the printing unit **13** and to the at least one print head **14** located there.

[0071] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the at least one printing unit **13** has at least one electrostatic print head **14** with a plurality of individually actuated individual nozzles **18** for the controlled dispensing of ink, and that the individual nozzles **18** are located in at least one row, one behind another in a print head longitudinal axis DL.

[0072] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the relative movement between the at least one print head **14** and the label primary material **11** is at a right angle or perpendicular to the print head longitudinal axis DL.

[0073] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the label primary material **11** during the printing is oriented horizontally or essentially horizontally.

[0074] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the at least one print head **14** is located above the label primary material **11**.

[0075] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to

possibly reside broadly in the method, characterized by at least two and preferably by at least three print heads **14**.

[0076] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that for the production of a multiple-color printed image, one color set of the multiple-printing is produced with each print head.

[0077] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the ink, after it has been applied to the label primary material **11** is dried or set by the application of energy, for example in the form of heat and/or UV light.

[0078] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the label primary material **11** is heated and/or statically charged before the printing.

[0079] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized by the use of a strip-format, e.g. self-adhesive label primary material **11** from which labels **2** are produced by separation.

[0080] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized in that the printing of the label primary material **11** takes place before the separation of labels **2**.

[0081] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized by the use of a single-sheet format label primary material.

[0082] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the method, characterized by the use of a labeling machine that employs a rotary construction, in which containers **3** to be printed are moved past the at least one labeling station **8** on a driven rotor that rotates around a vertical machine axis.

[0083] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in an apparatus for the labeling of bottles **3** or similar containers with labels **2** that are printed using a label primary material **11**, with at least one labeling station **8** past which containers **3** are moved on a transport element **7** and labels are attached to containers, characterized in that at least one printing unit **13** is provided in the at least one labeling station **8** for the printing of labels **2** before they are attached to containers.

[0084] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that at least one printing unit **13** is realized for a multiple-color printing of the label primary material **11**.

[0085] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in

that the printing unit **13** produces the printed image as a function of an electronic actuation system **15**.

[0086] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that the printing unit **13** produces the printed image as a function of print masks that are stored in a control device **15** electronically or in the form of software.

[0087] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that the printing unit **13** or at least one print head **14** of this unit prints the label primary material **11** line by line at a right angle to the longitudinal direction of the label primary material, and specifically for example over its entire width or almost its entire width.

[0088] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by means for the production of a relative movement during the printing between the label primary material **11** and the printing unit **13** or at least one print head **14** of this printing unit **13**.

[0089] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by feed means with which the label primary material **11** is moved relative to the printing unit **13** or to the at least one print head **14** located there.

[0090] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that the at least one printing unit **13** has at least one electrostatic print head **14** with a plurality of individually actuated individual nozzles **18** for the controlled dispensing of ink, and that the individual nozzles **18** are arranged in at least one row, one behind another, in a print head longitudinal axis DL.

[0091] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that the at least one print head **14** is oriented with a pressure head longitudinal axis DL at a right angle or perpendicular to the feed movement of the label primary material **11**.

[0092] Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that the label primary material **11** is oriented during the printing horizontally or essentially horizontally.

[0093] A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized in that the at least one print head **14** is located above the label primary material **11**.

[0094] Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by at least two and preferably by at least three print heads **14**.

[0095] Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to

possibly reside broadly in the apparatus, characterized in that for the production of a multiple-color image one color set of the multiple-color printed image is produced with each print head.

**[0096]** Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by means **26** for the drying of the ink after the application to the label primary material **11** by the effect of energy, for example by heating and/or UV light.

**[0097]** A further feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by means **25**, **24** for the heading and/or for the electrostatic charging of the label primary material **11** before printing.

**[0098]** Another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by its realization for the use of a strip-format, for example self-adhesive label primary material **11** from which labels **2** are produced by separation in a dispenser unit **27**.

**[0099]** Yet another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by its realization for the use of a single-sheet format label primary material.

**[0100]** Still another feature or aspect of an embodiment is believed at the time of the filing of this patent application to possibly reside broadly in the apparatus, characterized by its realization in the form of a labeling machine that employs a rotary construction in which containers **3** to be labeled are moved past the at least one labeling station **8** on a rotor **7** that is driven in rotation around a vertical machine axis.

**[0101]** The components disclosed in the various publications, disclosed or incorporated by reference herein, may possibly be used in possible embodiments of the present invention, as well as equivalents thereof.

**[0102]** Some examples of bottling systems, which may be used or adapted for use in at least one possible embodiment of the present may be found in the following U.S. Patents assigned to the Assignee herein, namely: U.S. Pat. No. 4,911,285; U.S. Pat. No. 4,944,830; U.S. Pat. No. 4,950,350; U.S. Pat. No. 4,976,803; U.S. Pat. No. 4,981,547; U.S. Pat. No. 5,004,518; U.S. Pat. No. 5,017,261; U.S. Pat. No. 5,062,917; U.S. Pat. No. 5,062,918; U.S. Pat. No. 5,075,123; U.S. Pat. No. 5,078,826; U.S. Pat. No. 5,087,317; U.S. Pat. No. 5,110,402; U.S. Pat. No. 5,129,984; U.S. Pat. No. 5,167,755; U.S. Pat. No. 5,174,851; U.S. Pat. No. 5,185,053; U.S. Pat. No. 5,217,538; U.S. Pat. No. 5,227,005; U.S. Pat. No. 5,413,153; U.S. Pat. No. 5,558,138; U.S. Pat. No. 5,634,500; U.S. Pat. No. 5,713,403; U.S. Pat. No. 6,276,113; U.S. Pat. No. 6,213,169; U.S. Pat. No. 6,189,578; U.S. Pat. No. 6,192,946; U.S. Pat. No. 6,374,575; U.S. Pat. No. 6,365,054; U.S. Pat. No. 6,619,016; No. 6,474,368; U.S. Pat. No. 6,494,238; U.S. Pat. No. 6,470,922; and U.S. Pat. No. 6,463,964.

**[0103]** Some examples of laser cutting apparatus and methods that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: No. 6,191,382 B1, entitled

“Dynamic Laser Cutting Apparatus”; No. 2003/0207062A1, entitled “Laser-Cuttable Multi-Layer Sheet Material”; No. 5,614,278 entitled “Strip of Separable Labels or Tags Having a Display Surface for Display of Information Thereon”; No. 4,189,337, entitled “Real Time Labeler System”; and No. 2004/0226659 A1, entitled “Label Application System”.

**[0104]** Some examples of heater arrangements that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following U.S. Patents: U.S. Pat. No. 6,404,421 issued to Meijler et al. on Jun. 11, 2002; U.S. Pat. No. 6,515,264 issued to Toya et al. on Feb. 4, 2003; U.S. Pat. No. 6,548,786 issued to Takizawa et al. on Apr. 15, 2003; U.S. Pat. No. 6,555,796 issued to Cusack on Apr. 29, 2003; U.S. Pat. No. 6,633,727 issued to Henrie et al. on Oct. 14, 2003; and U.S. Pat. No. 6,677,557 issued to Ito et al. on Jan. 13, 2004.

**[0105]** The purpose of the statements about the technical field is generally to enable the Patent and Trademark Office and the public to determine quickly, from a cursory inspection, the nature of this patent application. The description of the technical field is believed, at the time of the filing of this patent application, to adequately describe the technical field of this patent application. However, the description of the technical field may not be completely applicable to the claims as originally filed in this patent application, as amended during prosecution of this patent application, and as ultimately allowed in any patent issuing from this patent application. Therefore, any statements made relating to the technical field are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

**[0106]** Some examples of apparatus and methods of attaching sleeve labels that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following U.S. Patents: U.S. Pat. No. 4,108,705 issued to Hadl et al. on Aug. 22, 1978; U.S. Pat. No. 4,357,788 issued to Amberg on Nov. 9, 1982; U.S. Pat. No. 5,415,721 issued to Nickey et al. on May 16, 1995; U.S. Pat. No. 5,422,152 issued to Langeland et al. on Jun. 6, 1995; U.S. Pat. No. 5,483,783 issued to Lerner et al. on Jan. 16, 1996; U.S. Pat. No. 5,775,019 issued to Johnson on Jul. 7, 1998; U.S. Pat. No. 6,543,514 issued to Menayan on Apr. 8, 2003; and U.S. Pat. No. 6,523,328 issued to De Cardenas et al. on Feb. 25, 2003.

**[0107]** Some examples of laser printing arrangements that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following U.S. patents: U.S. Pat. No. 4,847,643 issued to Ohmori on Jul. 11, 1989; U.S. Pat. No. 5,294,945 issued to Omura et al. on Mar. 15, 1994; U.S. Pat. No. 5,528,280 issued to Endo et al. on Jun. 18, 1996; U.S. Pat. No. 6,210,778 issued to Poirier et al. on Apr. 3, 2001; U.S. Pat. No. 6,433,810 issued to Katayama et al. on Aug. 13, 2002; and U.S. Pat. No. 6,655,275 issued to Mugrauer on Dec. 2, 2003.

**[0108]** Some examples of self-adhesive labels that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: No. 5,614,278 entitled “Strip of Separable Labels or Tags Having a Display Surface for Display of Information

Thereon”; No. 2004/0157026 A1, entitled “Self-Adhesive Labels and Manufacture Thereof”; No. 2004/0028932 A1, entitled “Label Film with Improved Adhesion”; and No. 2003/0207062 A1, entitled “Laser-Cuttable Multi-Layer Sheet Material”.

[0109] The appended drawings in their entirety, including all dimensions, proportions and/or shapes in at least one embodiment of the invention, are accurate and are hereby included by reference into this specification.

[0110] Some examples of laser marking that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following U.S. patents: U.S. Pat. No. 6,429,889 issued to Murokh on Aug. 6, 2002; U.S. Pat. No. 6,483,073 issued to Tenderly on Nov. 19, 2002; U.S. Pat. No. 6,489,985 issued to Brodsky et al. on Dec. 3, 2002; U.S. Pat. No. 6,613,161 issued to Zheng et al. on Sep. 2, 2003; U.S. Pat. No. 6,627,299 issued to Feng et al. on Sep. 30, 2003; and U.S. Pat. No. 6,683,637 issued to Corbett on Jan. 27, 2004.

[0111] Some examples of blade cutting apparatus and methods that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patent application publications: No. 2003/0146943 A1, entitled “Label Printer-Cutter with Mutually Exclusive Printing and Cutting Operation”; U.S. Pat. No. 5,614,278 entitled “Strip of Separable Labels or Tags Having a Display Surface for Display of Information Thereon”; U.S. Pat. No. 4,189,337, entitled “Real Time Labeler System”; No. 2004/0226659 A1, entitled “Label Application System”; and No. 2004/0226659 A1, entitled “Label Application System”.

[0112] The background information is believed, at the time of the filing of this patent application, to adequately provide background information for this patent application. However, the background information may not be completely applicable to the claims as originally filed in this patent application, as amended during prosecution of this patent application, and as ultimately allowed in any patent issuing from this patent application. Therefore, any statements made relating to the background information are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

[0113] Some examples of ink jet printing apparatus and methods that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following U.S. patents: U.S. Pat. No. 6,582,047 issued to Koitabashi et al. on Jun. 24, 2003; U.S. Pat. No. 6,623,093 issued to Takahashi et al. on Sep. 23, 2003; U.S. Pat. No. 6,625,351 issued to Cox et al. on Sep. 23, 2003; U.S. Pat. No. 6,652,055 issued to Oikawa on Nov. 25, 2003; U.S. Pat. No. 6,669,767 issued to Blease et al. on Dec. 30, 2003; and U.S. Pat. No. 6,688,739 issued to Murray on Feb. 10, 2004.

[0114] Some examples of labeling apparatus and methods that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: U.S. Pat. No. 4,189,337, entitled “Real Time Labeler System”; No. 2004/0226659 A1, entitled “Label Application System”; U.S. Pat. No. 6,191,382 B1, entitled “Dynamic Laser Cutting Apparatus”; No. 2003/0146943 A1, entitled “Label Printer-Cutter with Mutu-

ally Exclusive Printing and Cutting Operation”; and No. 2002/0029855 A1, entitled “System for Printing and Applying Tape onto Surfaces”.

[0115] All, or substantially all, of the components and methods of the various embodiments may be used with at least one embodiment or all of the embodiments, if more than one embodiment is described herein.

[0116] Some examples of computer systems that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following U.S. Patents: U.S. Pat. No. 5,416,480 issued to Roach et al. on May 16, 1995; U.S. Pat. No. 5,479,355 issued to Hyduke on Dec. 26, 1995; U.S. Pat. No. 5,481,730 issued to Brown et al. on Jan. 2, 1996; U.S. Pat. No. 5,805,094 issued to Roach et al. on Sep. 8, 1998; U.S. Pat. No. 5,881,227 issued to Atkinson et al. on Mar. 9, 1999; and U.S. Pat. No. 6,072,462 issued to Moshovich on Jun. 6, 2000.

[0117] The purpose of the statements about the object or objects is generally to enable the Patent and Trademark Office and the public to determine quickly, from a cursory inspection, the nature of this patent application. The description of the object or objects is believed, at the time of the filing of this patent application, to adequately describe the object or objects of this patent application. However, the description of the object or objects may not be completely applicable to the claims as originally filed in this patent application, as amended during prosecution of this patent application, and as ultimately allowed in any patent issuing from this patent application. Therefore, any statements made relating to the object or objects are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

[0118] Some examples of corona elements that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: U.S. Pat. No. 6,951,992, entitled “Corona and static electrode assembly”; U.S. Pat. No. 7,151,902, entitled “Toner transfer technique”; U.S. Pat. No. 6,957,030, entitled “Method and apparatus for making signs”; U.S. Pat. No. 7,153,646, entitled “Photothermographic material”; and U.S. Pat. No. 7,155,150, entitled “Method and apparatus for developing a latent image using toner grains constituting a developer”.

[0119] All of the patents, patent applications and publications recited herein, and in the Declaration attached hereto, are hereby incorporated by reference as if set forth in their entirety herein.

[0120] Some examples of apparatus and methods for electrostatic charging that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: U.S. Pat. No. 6,951,377, entitled “Inside printing of flexible packages”; U.S. Pat. No. 6,981,767, entitled “Printed item having an image with a high durability and/or resolution”; U.S. Pat. No. 7,147,980, entitled “Toner and image forming apparatus”; U.S. Pat. No. 7,150,412, entitled “Method and apparatus for electrostatic spray”; and U.S. Pat. No. 7,153,622, entitled “Electrostatic charge image developing toner, producing method therefor, image forming method and image forming apparatus utilizing the toner, construct and method for making the construct”.



[0121] The summary is believed, at the time of the filing of this patent application, to adequately summarize this patent application. However, portions or all of the information contained in the summary may not be completely applicable to the claims as originally filed in this patent application, as amended during prosecution of this patent application, and as ultimately allowed in any patent issuing from this patent application. Therefore, any statements made relating to the summary are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

[0122] Some examples of apparatus and methods for the drying and/or hardening of ink that may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: U.S. Pat. No. 6,493,018, entitled "Wide format thermal printer"; U.S. Pat. No. 6,957,030, entitled "Method and apparatus for making signs"; U.S. Pat. No. 4,970,528, entitled "Method for uniformly drying ink on paper from an ink jet printer"; U.S. Pat. No. 6,312,123, entitled "Method and apparatus for UV ink jet printing on fabric and combination printing and quilting thereby"; and U.S. Pat. No. 6,857,737, entitled "UV ink printed graphic article".

[0123] It will be understood that the examples of patents, published patent applications, and other documents which are included in this application and which are referred to in paragraphs which state "Some examples of . . . which may possibly be used in at least one possible embodiment of the present application . . ." may possibly not be used or useable in any one or more embodiments of the application.

[0124] The sentence immediately above relates to patents, published patent applications and other documents either incorporated by reference or not incorporated by reference.

[0125] Some examples of lifting devices that may possibly be utilized or possibly adapted for use in at least one possible embodiment of the present application may possibly be found in the following patent publications: U.S. Pat. No. 2,535,272 issued to Detrez on Dec. 26, 1950; U.S. Pat. No. 2,642,214 issued to Lippold on Jun. 16, 1953; German Utility Model No. DE-GM 1,923,261 issued on Sep. 9, 1965; German Laid Open Patent Application No. DE-OS 1,532,586 published on Oct. 2, 1969; British Patent No. 1,188,888 issued Apr. 22, 1970; German Laid Open Patent Application No. DE-OS 26 52 910 published on May 24, 1978; German Patent No. DE-PS 26 52 918 issued on Oct. 26, 1978; German Utility Model No. DE-GM 83 04 995 issued on Dec. 22, 1983; German Patent No. DE-PS 26 30 100 issued on Dec. 3, 1981; and German Laid Open Patent Application No. DE-OS 195 45 080 published on Jun. 5, 1997.

[0126] The corresponding foreign and international patent publication applications, namely, Federal Republic of Germany Patent Application No. 10 2006 001 204.6, filed on Jan. 10, 2006, having inventor Volker TILL, and DE-OS 10 2006 001 204.6 and DE-PS 10 2006 001 204.6, are hereby incorporated by reference as if set forth in their entirety herein for the purpose of correcting and explaining any possible misinterpretations of the English translation thereof. In addition, the published equivalents of the above corresponding foreign and international patent publication applications, and other equivalents or corresponding applications, if any, in corresponding cases in the Federal Repub-

lic of Germany and elsewhere, and the references and documents cited in any of the documents cited herein, such as the patents, patent applications and publications, are hereby incorporated by reference as if set forth in their entirety herein.

[0127] All of the references and documents, cited in any of the documents cited herein, are hereby incorporated by reference as if set forth in their entirety herein. All of the documents cited herein, referred to in the immediately preceding sentence, include all of the patents, patent applications and publications cited anywhere in the present application.

[0128] U.S. patent application Ser. No. \_\_\_\_\_, filed on Jan. 10, 2007, having inventor Volker TILL, Attorney Docket No. NHL-HOL-149A, and title "BEVERAGE BOTTLING PLANT FOR FILLING BEVERAGE BOTTLES WITH A LIQUID BEVERAGE, WITH AN INFORMATION ADDING ARRANGEMENT FOR ADDING INFORMATION RELATING TO THE BEVERAGE BOTTLES, AND A METHOD OF OPERATING THE BEVERAGE BOTTLING PLANT", and corresponding Federal Republic of Germany Patent Application No. 10 2006 001 223.2, filed on Jan. 10, 2006, are hereby incorporated by reference as if set forth in their entirety herein.

[0129] The description of the embodiment or embodiments is believed, at the time of the filing of this patent application, to adequately describe the embodiment or embodiments of this patent application. However, portions of the description of the embodiment or embodiments may not be completely applicable to the claims as originally filed in this patent application, as amended during prosecution of this patent application, and as ultimately allowed in any patent issuing from this patent application. Therefore, any statements made relating to the embodiment or embodiments are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

[0130] Some examples of position sensors or position sensor systems that may be used or adapted for use in at least one possible embodiment of the present invention may be found in the following U.S. patents: U.S. Pat. No. 5,794,355, issued to inventor Nickum on Aug. 18, 1998; U.S. Pat. No. 5,520,290, issued to inventors Kumar et al. on May 28, 1996; U.S. Pat. No. 5,074,053, issued to inventor West on Dec. 24, 1991; and U.S. Pat. No. 4,087,012, issued to inventor Fogg on May 2, 1978.

[0131] The details in the patents, patent applications and publications may be considered to be incorporable, at applicant's option, into the claims during prosecution as further limitations in the claims to patentably distinguish any amended claims from any applied prior art.

[0132] Some examples of centering devices for bottle handling devices which may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in U.S. Ser. No. 10/813,657, entitled "A beverage bottling plant for filling bottles with a liquid beverage filling material, and an easily cleaned lifting device in a beverage bottling plant" and filed on Mar. 30, 2004; U.S. Ser. No. 10/786,256, entitled "A beverage bottling plant for filling bottles with a liquid beverage filling material, and a container filling lifting device for pressing containers to con-

tainer filling machines”, filed on Feb. 25, 2004; and U.S. Ser. No. 10/865,240, filed on Jun. 10, 2004. The above applications are hereby incorporated by reference as if set forth in their entirety herein.

[0133] The purpose of the title of this patent application is generally to enable the Patent and Trademark Office and the public to determine quickly, from a cursory inspection, the nature of this patent application. The title is believed, at the time of the filing of this patent application, to adequately reflect the general nature of this patent application. However, the title may not be completely applicable to the technical field, the object or objects, the summary, the description of the embodiment or embodiments, and the claims as originally filed in this patent application, as amended during prosecution of this patent application, and as ultimately allowed in any patent issuing from this patent application. Therefore, the title is not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

[0134] Some examples of labeling machines which may possibly be utilized in at least one possible embodiment may possibly be found in the following U.S. patents: U.S. Pat. No. 6,634,400, entitled “Labeling machine;” U.S. Pat. No. 6,561,246, entitled “Labeling machine capable of precise attachment of a label to different sizes of containers;” U.S. Pat. No. 6,550,512, entitled “Labeling machine capable of preventing erroneous attachment of labels on containers;” U.S. Pat. No. 6,543,514, entitled “In-line continuous feed sleeve labeling machine and method;” U.S. Pat. No. 6,378,587, entitled “Cylindrical container labeling machine;” U.S. Pat. No. 6,328,086, entitled “Labeling machine;” U.S. Pat. No. 6,315,021, entitled “Labeling machine;” U.S. Pat. No. 6,263,940, entitled “In-line continuous feed sleeve labeling machine and method;” U.S. Pat. No. 6,199,614, entitled “High speed labeling machine having a constant tension driving system;” U.S. Pat. No. 6,167,935, entitled “Labeling machine;” U.S. Pat. No. 6,066,223, entitled “Labeling machine and method;” U.S. Pat. No. 6,050,319, entitled “Non-round container labeling machine and method;” and U.S. Pat. No. 6,045,616, entitled “Adhesive station and labeling machine.”

[0135] The abstract of the disclosure is submitted herewith as required by 37 C.F.R. §1.72(b). As stated in 37 C.F.R. §1.72(b):

[0136] A brief abstract of the technical disclosure in the specification must commence on a separate sheet, preferably following the claims, under the heading “Abstract of the Disclosure.” The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

Therefore, any statements made relating to the abstract are not intended to limit the claims in any manner and should not be interpreted as limiting the claims in any manner.

[0137] Some examples of bottling systems which may possibly be utilized or adapted for use in at least one possible embodiment may possibly be found in the following U.S. patents: U.S. Pat. No. 6,684,602, entitled “Compact bottling

machine;” U.S. Pat. No. 6,470,922, entitled “Bottling plant for bottling carbonated beverages;” U.S. Pat. No. 6,390,150, entitled “Drive for bottling machine;” U.S. Pat. No. 6,374,575, entitled “Bottling plant and method of operating a bottling plant;” U.S. Pat. No. 6,192,946, entitled “Bottling system;” U.S. Pat. No. 6,185,910, entitled “Method and an apparatus for high-purity bottling of beverages;” U.S. Pat. No. 6,058,985, entitled “Bottling machine with a set-up table and a set-up table for a bottling machine and a set-up table for a bottle handling machine;” U.S. Pat. No. 5,996,322, entitled “In-line bottling plant;” U.S. Pat. No. 5,896,899, entitled “Method and an apparatus for sterile bottling of beverages;” U.S. Pat. No. 5,848,515, entitled “Continuous-cycle sterile bottling plant;” U.S. Pat. No. 5,634,500, entitled “Method for bottling a liquid in bottles or similar containers;” and U.S. Pat. No. 5,425,402, entitled “Bottling system with mass filling and capping arrays.”

[0138] The embodiments of the invention described herein above in the context of the preferred embodiments are not to be taken as limiting the embodiments of the invention to all of the provided details thereof, since modifications and variations thereof may be made without departing from the spirit and scope of the embodiments of the invention.

#### AT LEAST PARTIAL NOMENCLATURE

- [0139] 1 Labeling machine
- [0140] 2 Label
- [0141] 3 Bottle
- [0142] 4 Container inlet
- [0143] 5 Conveyor
- [0144] 6 Container receptacle
- [0145] 7 Rotor
- [0146] 8 Labeling station
- [0147] 9 Container outlet
- [0148] 10 Conveyor
- [0149] 11 Strip-format label primary material
- [0150] 11.1-11.3 Layers of the label primary material 11
- [0151] 12 Buffer or storage unit for label primary material 11
- [0152] 13 Printing unit
- [0153] 14 Print head
- [0154] 15 Electronic control device
- [0155] 16 Housing of the print head 14
- [0156] 16.1 Housing segment
- [0157] 17 Housing interior
- [0158] 18 Individual nozzles
- [0159] 19, 20 Deflector unit for label primary material 11
- [0160] 21 Opening of the individual nozzle 18
- [0161] 22 Electrode of the individual nozzle 18
- [0162] 23 Dot
- [0163] 24 Corona element

- [0164] 25 Preheater element
- [0165] 26 Dryer unit
- [0166] 27 Dispenser unit
- [0167] 28 Tear-off edge
- [0168] 29 Collector unit
- [0169] 30 Cutting unit
- [0170] A Rotational movement of the rotor 7
- [0171] B Feed direction of the label primary material 11
- [0172] DL Print head longitudinal axis
- [0173] DE Printing plane

What is claimed is:

1. A method of operating a beverage bottling plant for filling beverage bottles with liquid beverage material, said beverage bottling plant comprising: a plurality of rotary machines comprising at least a rotary beverage bottle filling machine, a rotary beverage bottle closing machine, and a rotary beverage bottle information adding machine; a first conveyor arrangement being configured and disposed to convey beverage bottles to be filled to said beverage bottle filling machine; said beverage bottle filling machine being configured and disposed to fill beverage bottles with liquid beverage material; said beverage bottle filling machine comprising: a rotor; a rotatable vertical machine column; said rotor being connected to said vertical machine column to permit rotation of said rotor about said vertical machine column; a plurality of beverage bottle filling elements for filling beverage bottles with liquid beverage material being disposed on the periphery of said rotor; each of said plurality of beverage bottle filling elements comprising a beverage bottle carrier being configured and disposed to receive and hold beverage bottles to be filled; each of said plurality of beverage bottle filling elements being configured and disposed to dispense liquid beverage material into beverage bottles to be filled; at least one liquid reservoir being configured to hold a supply of liquid beverage material; at least one supply line being configured and disposed to connect said at least one liquid reservoir to said beverage bottle filling machine to supply liquid beverage material to said beverage bottle filling machine; a first star wheel structure being configured and disposed to move beverage bottles into said beverage bottle filling machine; a second star wheel structure being configured and disposed to move beverage bottles out of said beverage bottle filling machine; a second conveyor arrangement being configured and disposed to convey filled beverage bottles from said beverage bottle filling machine to said beverage bottle closing machine; said beverage bottle closing machine being configured and disposed to close tops of filled beverage bottles; said beverage bottle closing machine comprising: a rotor; a rotatable vertical machine column; said rotor being connected to said vertical machine column to permit rotation of said rotor about said vertical machine column; a plurality of closing devices being disposed on the periphery of said rotor; each of said plurality of closing devices being configured and disposed to place closures on filled beverage bottles; each of said plurality of closing devices comprising a beverage bottle carrier being configured and disposed to receive and hold filled beverage bottles; a first star wheel structure being configured and disposed to move filled

beverage bottles into said beverage bottle closing machine; a second star wheel structure being configured and disposed to move filled, closed beverage bottles out of said beverage bottle closing machine; a third conveyor arrangement being configured and disposed to convey filled, closed beverage bottles from said beverage bottle closing machine to said beverage bottle information adding machine; said beverage bottle information adding machine being configured and disposed to add information to filled, closed beverage bottles; said beverage bottle information adding machine comprising: a rotor; a rotatable vertical machine column; said rotor being connected to said vertical machine column to permit rotation of said rotor about said vertical machine column; a plurality of beverage bottle support structures being disposed on the periphery of said rotor; said beverage bottle support structures being configured to support and hold filled, closed beverage bottles; a first star wheel structure being configured and disposed to move filled, closed beverage bottles into said beverage bottle information adding machine; a second star wheel structure being configured and disposed to move beverage bottles out of said beverage bottle information adding machine; a beverage bottle information adding device being configured and disposed to add information to a beverage bottle; and said beverage bottle information adding device comprising a shaping and forming arrangement for shaping and forming an information containing device to be placed on a beverage bottle, said method comprising the steps of:

- moving empty beverage bottles to said beverage bottle filling machine;
- filling empty beverage bottles with a liquid beverage material with said beverage bottle filling machine;
- moving filled beverage bottles to said beverage bottle closing machine;
- closing filled beverage bottles with said beverage bottle closing machine;
- moving filled, closed beverage bottles to said beverage bottle information adding machine;
- shaping and forming said information containing devices with said shaping and forming arrangement in said beverage bottle information adding machine; and
- adding information to beverage bottles with said beverage bottle information adding machine by placing said information containing devices on filled, closed beverage bottles.

2. The method of operating a beverage bottling plant according to claim 1, wherein one of (A) and (B) but not both of (A) and (B):

- (A) said information containing devices contain information prior to said step of shaping and forming said information containing devices with said shaping and forming arrangement, and said step of shaping and forming said information containing devices comprises adding additional information to said information containing devices; and
- (B) said information containing devices are blank prior to said step of shaping and forming said information containing devices with said shaping and forming arrangement, and said step of shaping and forming said

information containing devices comprises adding all desired information to said information containing devices.

3. The method of operating a beverage bottling plant according to claim 2, wherein the information containing devices have information displayed in a plurality of colors.

4. The method of operating a beverage bottling plant according to claim 3, wherein said step of shaping and forming comprises forming information using an electronic actuation system and adding information using at least one information adding head.

5. The method of operating a beverage bottling plant according to claim 4, wherein at least one of:

(C) the printing unit produces the printed image as a function of print masks that are stored electronically or in the form of software in a control device;

(D) the printed image is modified at least partly during a labeling process;

(E) the label primary material is printed line-by-line at a right angle to the longitudinal direction of the label primary material, and specifically for example over its entire width or almost its entire width;

(F) the printing is done with a relative movement between the label primary material and the printing unit or at least one print head of this printing unit;

(G) the label primary material is moved relative to the printing unit and to the at least one print head located there;

(H) the at least one printing unit has at least one electrostatic print head with a plurality of individually actuated individual nozzles for the controlled dispensing of ink, and that the individual nozzles are located in at least one row, one behind another in a print head longitudinal axis;

(I) the relative movement between the at least one print head and the label primary material is at a right angle or perpendicular to the print head longitudinal axis;

(J) the label primary material during the printing is oriented horizontally or essentially horizontally;

(K) the at least one print head is located above the label primary material;

(L) at least two and preferably by at least three print heads;

(M) for the production of a multiple-color printed image, one color set of the multiple-printing is produced with each print head;

(N) the ink, after it has been applied to the label primary material is dried or set by the application of energy, for example in the form of heat and/or UV light;

(O) the label primary material is heated and/or statically charged before the printing;

(P) the use of a strip-format, e.g. self-adhesive label primary material from which labels are produced by separation;

(O) the printing of the label primary material takes place before the separation of labels;

(R) the use of a single-sheet format label primary material; and

(S) the use of a labeling machine that employs a rotary construction, in which beverage bottles to be printed are moved past the at least one labeling station on a driven rotor that rotates around a vertical machine axis.

6. The method of operating a beverage bottling plant according to claim 4, wherein:

(C) the printing unit produces the printed image as a function of print masks that are stored electronically or in the form of software in a control device;

(D) the printed image is modified at least partly during a labeling process;

(E) the label primary material is printed line-by-line at a right angle to the longitudinal direction of the label primary material, and specifically for example over its entire width or almost its entire width;

(F) the printing is done with a relative movement between the label primary material and the printing unit or at least one print head of this printing unit;

(G) the label primary material is moved relative to the printing unit and to the at least one print head located there;

(H) the at least one printing unit has at least one electrostatic print head with a plurality of individually actuated individual nozzles for the controlled dispensing of ink, and that the individual nozzles are located in at least one row, one behind another in a print head longitudinal axis;

(I) the relative movement between the at least one print head and the label primary material is at a right angle or perpendicular to the print head longitudinal axis;

(J) the label primary material during the printing is oriented horizontally or essentially horizontally;

(K) the at least one print head is located above the label primary material;

(L) at least two and preferably by at least three print heads;

(M) for the production of a multiple-color printed image, one color set of the multiple-printing is produced with each print head;

(N) the ink, after it has been applied to the label primary material is dried or set by the application of energy, for example in the form of heat and/or UV light;

(O) the label primary material is heated and/or statically charged before the printing;

(P) the use of a strip-format, e.g. self-adhesive label primary material from which labels are produced by separation;

(O) the printing of the label primary material takes place before the separation of labels;

(R) the use of a single-sheet format label primary material; and

(S) the use of a labeling machine that employs a rotary construction, in which beverage bottles to be printed

are moved past the at least one labeling station on a driven rotor that rotates around a vertical machine axis.

7. A beverage bottling plant for filling beverage bottles with liquid beverage material, said beverage bottling plant comprising:

a plurality of rotary machines comprising at least a rotary beverage bottle filling machine, a rotary beverage bottle closing machine, and a rotary beverage bottle information adding machine;

a first conveyor arrangement being configured and disposed to convey beverage bottles to be filled to said beverage bottle filling machine;

said beverage bottle filling machine being configured and disposed to fill beverage bottles with liquid beverage material;

said beverage bottle filling machine comprising:

a rotor;

a rotatable vertical machine column;

said rotor being connected to said vertical machine column to permit rotation of said rotor about said vertical machine column;

a plurality of beverage bottle filling elements for filling beverage bottles with liquid beverage material being disposed on the periphery of said rotor;

each of said plurality of beverage bottle filling elements comprising a beverage bottle carrier being configured and disposed to receive and hold beverage bottles to be filled;

each of said plurality of beverage bottle filling elements being configured and disposed to dispense liquid beverage material into beverage bottles to be filled;

at least one liquid reservoir being configured to hold a supply of liquid beverage material;

at least one supply line being configured and disposed to connect said at least one liquid reservoir to said beverage bottle filling machine to supply liquid beverage material to said beverage bottle filling machine;

a first star wheel structure being configured and disposed to move beverage bottles into said beverage bottle filling machine;

a second star wheel structure being configured and disposed to move beverage bottles out of said beverage bottle filling machine;

a second conveyor arrangement being configured and disposed to convey filled beverage bottles from said beverage bottle filling machine to said beverage bottle closing machine;

said beverage bottle closing machine being configured and disposed to close tops of filled beverage bottles;

said beverage bottle closing machine comprising:

a rotor;

a rotatable vertical machine column;

said rotor being connected to said vertical machine column to permit rotation of said rotor about said vertical machine column;

a plurality of closing devices being disposed on the periphery of said rotor;

each of said plurality of closing devices being configured and disposed to place closures on filled beverage bottles;

each of said plurality of closing devices comprising a beverage bottle carrier being configured and disposed to receive and hold filled beverage bottles;

a first star wheel structure being configured and disposed to move filled beverage bottles into said beverage bottle closing machine;

a second star wheel structure being configured and disposed to move filled, closed beverage bottles out of said beverage bottle closing machine;

a third conveyor arrangement being configured and disposed to convey filled, closed beverage bottles from said beverage bottle closing machine to said beverage bottle information adding machine;

said beverage bottle information adding machine being configured and disposed to add information to filled, closed beverage bottles;

said beverage bottle information adding machine comprising:

a rotor;

a rotatable vertical machine column;

said rotor being connected to said vertical machine column to permit rotation of said rotor about said vertical machine column;

a plurality of beverage bottle support structures being disposed on the periphery of said rotor;

said beverage bottle support structures being configured to support and hold filled, closed beverage bottles;

a first star wheel structure being configured and disposed to move filled, closed beverage bottles into said beverage bottle information adding machine;

a second star wheel structure being configured and disposed to move beverage bottles out of said beverage bottle information adding machine;

a beverage bottle information adding device being configured and disposed to add information to a beverage bottle; and

said beverage bottle information adding device comprising a shaping and forming arrangement for shaping and forming an information containing device to be placed on a beverage bottle.

8. The beverage bottling plant according to claim 7, wherein said information adding device is configured to add multiple-color information.

9. The beverage bottling plant according to claim 8, wherein said information adding device is configured to add information as a function of an electronic actuation system.

10. The beverage bottling plant according to claim 9, wherein said information adding device adds the information as a function of information adding forms that are stored in a control device electronically or in the form of software.

11. The beverage bottling plant according to claim 10, wherein said information adding device adds the information to the information containing devices line by line at a right angle to the longitudinal direction of the information containing devices and over its entire width or almost its entire width.

12. The beverage bottling plant according to claim 11, wherein at least one of:

- (A) said information adding machine comprises means for the production of a relative movement during the printing between the label primary material and the printing unit or at least one print head of this printing unit;
- (B) said information adding machine comprises feed means with which the label primary material is moved relative to the printing unit or to the at least one print head located there;
- (C) the at least one printing unit has at least one electrostatic print head with a plurality of individually actuated individual nozzles for the controlled dispensing of ink, and that the individual nozzles are arranged in at least one row, one behind another, in a print head longitudinal axis;
- (D) the at least one print head is oriented with a pressure head longitudinal axis at a right angle or perpendicular to the feed movement of the label primary material;
- (E) the label primary material is oriented during the printing horizontally or essentially horizontally;
- (F) the at least one print head is located above the label primary material;
- (G) said information adding machine comprises at least two and preferably at least three print heads;
- (H) for the production of a multiple-color image one color set of the multiple-color printed image is produced with each print head;
- (I) said information adding machine comprises means for the drying of the ink after the application to the label primary material by the effect of energy, for example by heating and/or UV light;
- (J) said information adding machine comprises means for the heading and/or for the electrostatic charging of the label primary material before printing;
- (K) said information adding machine is configured for the use of a strip-format, for example self-adhesive label primary material from which labels are produced by separation in a dispenser unit;
- (L) said information adding machine is configured for the use of a single-sheet format label primary material; and
- (M) said information adding machine comprises a labeling machine that employs a rotary construction in which beverage bottles to be labeled are moved past the at least one labeling station on a rotor that is driven in rotation around a vertical machine axis.

13. The beverage bottling plant according to claim 11, wherein all of:

- (A) said information adding machine comprises means for the production of a relative movement during the printing between the label primary material and the printing unit or at least one print head of this printing unit;
- (B) said information adding machine comprises feed means with which the label primary material is moved relative to the printing unit or to the at least one print head located there;
- (C) the at least one printing unit has at least one electrostatic print head with a plurality of individually actuated individual nozzles for the controlled dispensing of ink, and that the individual nozzles are arranged in at least one row, one behind another, in a print head longitudinal axis;
- (D) the at least one print head is oriented with a pressure head longitudinal axis at a right angle or perpendicular to the feed movement of the label primary material;
- (E) the label primary material is oriented during the printing horizontally or essentially horizontally;
- (F) the at least one print head is located above the label primary material;
- (G) said information adding machine comprises at least two and preferably at least three print heads;
- (H) for the production of a multiple-color image one color set of the multiple-color printed image is produced with each print head;
- (I) said information adding machine comprises means for the drying of the ink after the application to the label primary material by the effect of energy, for example by heating and/or UV light;
- (J) said information adding machine comprises means for the heading and/or for the electrostatic charging of the label primary material before printing;
- (K) said information adding machine is configured for the use of a strip-format, for example self-adhesive label primary material from which labels are produced by separation in a dispenser unit;
- (L) said information adding machine is configured for the use of a single-sheet format label primary material; and
- (M) said information adding machine comprises a labeling machine that employs a rotary construction in which beverage bottles to be labeled are moved past the at least one labeling station on a rotor that is driven in rotation around a vertical machine axis.

13. A method of operating a beverage bottling plant for filling beverage bottles with liquid beverage material, said beverage bottling plant comprising: a filling machine being configured and disposed to fill empty beverage bottles with a filling material; a first moving arrangement being configured and disposed to move beverage bottles to said filling machine; said filling machine comprising: a moving device being configured and disposed to accept beverage bottles from said first moving arrangement and to move beverage bottles within said filling machine; an apparatus being configured and disposed to hold beverage bottles during

filling; and at least one filling device being configured and disposed to fill beverage bottles with a filling material upon the beverage bottles being within said filling machine; a closing machine being configured and disposed to close filled beverage bottles; a second moving arrangement being configured and disposed to accept filled beverage bottles from said moving device of said filling machine to move filled beverage bottles out of said filling machine; said second moving arrangement being configured and disposed to move filled beverage bottles from said filling machine to said closing machine; said closing machine comprising: a moving device being configured and disposed to accept filled beverage bottles from said second moving arrangement and to move filled beverage bottles within said closing machine; an apparatus being configured and disposed to hold filled beverage bottles during closing; and at least one closing device being configured and disposed to close filled beverage bottles upon the filled beverage bottles being within said closing machine; a third moving arrangement being configured and disposed to accept filled, closed beverage bottles from said closing machine to move filled beverage bottles out of said closing machine; said third moving arrangement being configured and disposed to move filled, closed beverage bottles from said closing machine to said information adding machine; said information adding machine being configured and disposed to add information to filled, closed beverage bottles; said beverage bottle information adding machine comprising: a moving device being configured and disposed to accept filled, closed beverage bottles from said third moving arrangement and to move filled beverage bottles within said information adding machine; an apparatus being configured and disposed to hold filled, closed beverage bottles during adding of information; a beverage bottle information adding device being configured and disposed to add information to a beverage bottle; and said beverage bottle information adding device comprising a shaping and forming arrangement for shaping and forming an information containing device to be placed on a beverage bottle;

said method comprising the steps of:

- filling beverage bottles with a liquid beverage material with said beverage bottle filling machine;
- closing beverage bottles with said beverage bottle closing machine;
- shaping and forming said information containing devices with said shaping and forming arrangement in said beverage bottle information adding machine; and
- adding information to beverage bottles with said beverage bottle information adding machine by placing said information containing devices on beverage bottles.

**15.** The method of operating a beverage bottling plant according to claim **14**, wherein one of (A) and (B) but not both of (A) and (B):

- (A) said information containing devices contain information prior to said step of shaping and forming said information containing devices with said shaping and forming arrangement, and said step of shaping and forming said information containing devices comprises adding additional information to said information containing devices; and

- (B) said information containing devices are blank prior to said step of shaping and forming said information containing devices with said shaping and forming arrangement, and said step of shaping and forming said information containing devices comprises adding all desired information to said information containing devices.

**16.** The method of operating a beverage bottling plant according to claim **15**, wherein the information containing devices have information displayed in a plurality of colors.

**17.** The method of operating a beverage bottling plant according to claim **16**, wherein said step of shaping and forming comprises forming information using an electronic actuation system and adding information using at least one information adding head.

**18.** The method of operating a beverage bottling plant according to claim **17**, wherein the printing unit produces the printed image as a function of print masks that are stored electronically or in the form of software in a control device.

**19.** The method of operating a beverage bottling plant according to claim **18**, wherein at least one of:

- (D) the printed image is modified at least partly during a labeling process;
- (E) the label primary material is printed line-by-line at a right angle to the longitudinal direction of the label primary material, and specifically for example over its entire width or almost its entire width;
- (F) the printing is done with a relative movement between the label primary material and the printing unit or at least one print head of this printing unit;
- (G) the label primary material is moved relative to the printing unit and to the at least one print head located there;
- (H) the at least one printing unit has at least one electrostatic print head with a plurality of individually actuated individual nozzles for the controlled dispensing of ink, and that the individual nozzles are located in at least one row, one behind another in a print head longitudinal axis;
- (I) the relative movement between the at least one print head and the label primary material is at a right angle or perpendicular to the print head longitudinal axis;
- (J) the label primary material during the printing is oriented horizontally or essentially horizontally;
- (K) the at least one print head is located above the label primary material;
- (L) at least two and preferably by at least three print heads;
- (M) for the production of a multiple-color printed image, one color set of the multiple-printing is produced with each print head;
- (N) the ink, after it has been applied to the label primary material is dried or set by the application of energy, for example in the form of heat and/or UV light;
- (O) the label primary material is heated and/or statically charged before the printing;

- (P) the use of a strip-format, e.g. self-adhesive label primary material from which labels are produced by separation;
- (O) the printing of the label primary material takes place before the separation of labels;
- (R) the use of a single-sheet format label primary material; and
- (S) the use of a labeling machine that employs a rotary construction, in which beverage bottles to be printed are moved past the at least one labeling station on a driven rotor that rotates around a vertical machine axis.
20. The method of operating a beverage bottling plant according to claim 18, wherein all of:
- (D) the printed image is modified at least partly during a labeling process;
- (E) the label primary material is printed line-by-line at a right angle to the longitudinal direction of the label primary material, and specifically for example over its entire width or almost its entire width;
- (F) the printing is done with a relative movement between the label primary material and the printing unit or at least one print head of this printing unit;
- (G) the label primary material is moved relative to the printing unit and to the at least one print head located there;
- (H) the at least one printing unit has at least one electrostatic print head with a plurality of individually actuated individual nozzles for the controlled dispensing of ink, and that the individual nozzles are located in at least one row, one behind another in a print head longitudinal axis;
- (I) the relative movement between the at least one print head and the label primary material is at a right angle or perpendicular to the print head longitudinal axis;
- (J) the label primary material during the printing is oriented horizontally or essentially horizontally;
- (K) the at least one print head is located above the label primary material;
- (L) at least two and preferably by at least three print heads;
- (M) for the production of a multiple-color printed image, one color set of the multiple-printing is produced with each print head;
- (N) the ink, after it has been applied to the label primary material is dried or set by the application of energy, for example in the form of heat and/or UV light;
- (O) the label primary material is heated and/or statically charged before the printing;
- (P) the use of a strip-format, e.g. self-adhesive label primary material from which labels are produced by separation;
- (O) the printing of the label primary material takes place before the separation of labels;
- (R) the use of a single-sheet format label primary material; and
- (S) the use of a labeling machine that employs a rotary construction, in which beverage bottles to be printed are moved past the at least one labeling station on a driven rotor that rotates around a vertical machine axis.

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