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(54) **SYSTEM FOR FLEXIBLE FOOD OR BEVERAGE PACKS**

SYSTEM FÜR FLEXIBLE LEBENSMITTEL- ODER GETRÄNKEVERPACKUNGEN

SYSTÈME POUR DES EMBALLAGES FLEXIBLES POUR ALIMENTS OU POUR BOISSONS

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Description

Field of the invention

[0001] The present invention relates to a system for flexible food or beverage packs, in particular to a system encoding information related to the products and to the recipe parameters to be applied by a beverage preparation machine in order to prepare a certain beverage.

Background of the invention

[0002] Preparing beverages by introducing a capsule containing a food or beverage ingredient, such as ground coffee or instant coffee, in a beverage dispensing machine and injecting water into the capsule is known in the state of the art: the beverage or food ingredient is typically extracted or dissolved into water to form the beverage or the desired final product, which flows out of the capsule through a suitable outlet.

[0003] As such, different capsules have been developed in the past, these capsules being at least differentiated by the nature of the capsule body used for storing the food or the beverage ingredient. While most of the capsules are made of a rigid body or semi-rigid body, typically made through injection moulding or thermoforming, flexible types of packs can be made out of foil materials. Flexible packs have generally the advantage to semi-rigid and rigid capsules that less amount of material is used to pack the product which leads to overall less production cost, to lower life cycle impact shown in several life-cycle assessments and to advantages on the part of the user, who will need less available space for storing these packs, as they are more compact.

[0004] It is known in the state of the art, for example as per document WO 99/05044, or WO2011/054402 A1, a flexible beverage-producing sachet comprising a beverage ingredient in a volume formed by bonding two laminates at their edges, having a base seam into which a conduit of rigid plastics is bonded. An inlet nozzle is provided at the top of the resulting sachet for introducing water that is mixed with the beverage or food ingredient inside the inner volume of the sachet, the beverage produced being then evacuated through a beverage outlet arranged at the bottom of the pack, where closing means are provided, such that the closing means are adapted to open under pressure when pressurized water is introduced into the sachet, allowing the beverage to evacuate through the beverage outlet.

[0005] Other flexible sachets are known in the art having a container where a fitment assembly or spout is arranged on one of its edges, typically on the lower edge. Moreover, this spout is overwrapped by the flexible film configuring the container, for hygiene reasons and to ensure a proper barrier, in particular to light and moisture. A pack comprising such a spout is for example described in European Patent Application EP 16184302.4 belonging to the same applicant, where the spout comprises

two parts relatively moveable with respect to each other for adopting different positioning. The spout is initially provided overwrapped by the flexible film configuring the container and, when it is arranged in a beverage preparation device, it is first pierced to be engaged with a corresponding device part and to inject a fluid, typically water, inside the container, in order to prepare the beverage; then, the two parts of the spout are moved relatively to each other in order to allow the dispensing of the beverage and then closing it back to avoid dripping.

[0006] In the sachets comprising the spouts described, it would be highly desirable to provide an encoding system providing information on the type of products prepared and also on the parameters that a beverage preparation device should apply in order to prepare and dispense a high quality food or beverage product. This information could be provided by codes or identification means but this makes the beverage preparation device more complex. Moreover, it would be desirable to provide a secondary encoding system, very simple, in parallel, to confirm the information provided to the device by other identification means or to work in case the first identification means are damaged for example or the like.

[0007] The present invention comes to provide a solution to these needs, as it will be further explained. The invention also aims at other objects and particularly at the solution of other problems as will appear in the rest of the present description.

Summary of the invention

[0008] According to a first aspect, the invention relates to a spout comprising at least two parts relatively moveable with respect to each other such that at least one of the two parts of the spout comprise means presenting a measurable resistance to being connected to an engaging part of a beverage preparation device and/or to the relative movement of the two parts of the spout, these means further comprising one or a plurality of indents or bumps.

[0009] Preferably, in the spout of the invention, the presence or not of an indent or a bump is translated into binary format for configuring a code. Typically, the profile of the indents or bumps define a digital value for configuring a code.

[0010] According to a second aspect, the invention relates to a pack for preparing a food or beverage product comprising a spout as the one described and a container configured to comprise a product to prepare the said food or beverage product, wherein the one or plurality of indents or bumps configure a code comprising the information on the product inside the container and/or on the processing of the said product.

[0011] Typically, in the pack of the invention, the container is configured by at least one flexible film folded in order to shape an enclosed space where the food or beverage product is arranged. According to a preferred embodiment, the flexible film is configured overwrapping the

spout in its entirety except for the part of the spout which is in direct communication with the inner volume of the container.

[0012] Preferably, the pack of the present invention is configured for allowing the injection of a fluid through the spout and to create a jet inside the volume of the container to prepare the food or beverage product.

[0013] Yet according to another aspect, the invention relates to a system for preparing a food or beverage product comprising a pack as the one described comprising a product and a beverage preparation device that will introduce a fluid in the form of a jet inside the volume of the pack.

[0014] Preferably, in the system of the invention, the beverage preparation device comprises a control unit configured for measuring along time the resistance of the connection of the beverage preparation device to the spout and the resistance of the relative movement of the two parts of the spout, determining a code, as a function of the bumps or indents, this code providing information on the type of food or beverage product in the pack and on the parameters to process the product in the said pack.

[0015] Typically, in the system of the invention, the beverage preparation device comprises a control unit configured for measuring along time, during the food or beverage preparation, the current provided by a driving motor driving the connection of the device to the spout of the pack and also driving the movement of the two parts of the spout relative to each other, in order to determine the profile of the bumps or indents.

[0016] System according to claim 10 wherein the control unit is configured to transform the current value of the driving motor into a motor torque or a resistance force value along time, during the food or beverage preparation, in order to determine the profile of the bumps or indents.

[0017] The code in the system according to the invention can be an analog format or a digital format.

[0018] Still according to another aspect, the invention further refers to a method for preparing a food or beverage product from a pack in a system as the one described previously, the method comprising the steps of:

- monitoring along time the resistance of the connection of the device to the spout of the pack and also the resistance of the relative movement of the two parts of the spout;
- configuring a code with the said monitored resistance along time;
- using the information of the said code and applying the process parameters corresponding to the said code read for preparing the corresponding food or beverage product in the pack.

[0019] According to the invention, the information from the code corresponding to the type of product and to the process parameters to apply for its preparation in a corresponding food or beverage device can be comprised

in the device itself (internal memory of it, for example) or in an external device to which the control unit will connect to retrieve the same, or for example in an external database or cloud.

[0020] In the method of the invention, the resistance of the connection of the device to the spout of the pack and also the resistance of the relative movement of the two parts of the spout is typically measured by monitoring the current from the driving motor driving the connection to the spout and the relative movement of the two parts of the spout.

[0021] Preferably, in the method according to the invention, the process parameters comprise one or a combination of: flow of fluid introduced in the spout, total volume of fluid introduced, temperature of the fluid, processing time, delivery time.

Brief description of the drawings

[0022] Further features, advantages and objects of the present invention will become apparent for a skilled person when reading the following detailed description of non-limiting embodiments of the present invention, when taken in conjunction with the appended drawings, in which:

Figures 1a-c show different views of a system for flexible food or beverage packs according to the present invention, showing the way the beverage preparation machine pierces the pack and moves the spout linearly downwards to allow dispensing.

Figures 2a-c show a system for flexible food or beverage packs according to the present invention, showing the way the beverage preparation machine pierces the pack (Figures 2a-b) and a graph showing the variation of the driving motor torque when the pack is pierced (Figure 2c).

Figures 3a-c show a system for flexible food or beverage packs according to the present invention, showing the way the beverage preparation machine moves the spout linearly downwards to allow dispensing (Figures 3a-b) and a graph showing the variation of the driving motor torque when the spout moves downwards (Figure 3c).

Figures 4a-e show a system for flexible food or beverage packs according to the invention, showing the way the beverage preparation machine pierces the pack (Figures 4a-d) and a graph showing the variation of the driving motor torque when the pack is pierced (Figure 4e).

Figures 5a-d show a system for flexible food or beverage packs according to the present invention, showing the way the beverage preparation machine moves the spout linearly downwards to allow dis-

pensing (Figures 5a-c) and a graph showing the variation of the driving motor torque when the spout moves downwards (Figure 5d).

Figure 6 represents a graph showing the variation of the driving motor torque first when the pack is pierced and then when the spout is moved linearly downwards to allow dispensing, according to the present invention.

Figures 7a-c show different graphs showing the variation of the driving motor torque first when the pack is pierced and then when the spout is moved linearly downwards to allow dispensing, according to the present invention, designed depending on the measurement resolution and spout design constraints.

Figure 8 shows a general overview of a flexible food or beverage pack used in the system of the present invention.

Figures 9a-b show a possible configuration of the information encoded in a system according to the present invention, as shown in Figures 7a-c, providing information on the type of food or beverage product and/or on the processing parameters to be applied by a beverage dispensing device.

Detailed description of exemplary embodiments

[0023] As previously described, the invention relates to a system for flexible food or beverage packs 100: the system of the invention comprises a flexible food or beverage pack 100 and a beverage preparation machine, where the pack will be inserted and a food or beverage product will be prepared and delivered. A representative pack 100 according to the invention is shown in Figure 8, the pack comprising a container 30 and a fitment assembly or spout 10. The container 30 is configured by one or more flexible sheets overwrapping the spout 10, such that only the part of the spout in communication with the inner volume of the container 30 is not covered by a film or sheet. The pack 100 used in the system of the invention is known as a flexible sachet or pouch.

[0024] The spout 10 in the pack of the invention is as the one described in document EP 16184302.4 belonging to the same applicant, and herewith incorporated by reference, in its entirety. The spout comprises two parts, 11 and 12, moveable with respect to each other, being typically injected elements in plastic. Typically, a primary part 11 is fixed to the beverage preparation device and a secondary part 12 moves linearly with respect to the said fixed part 11. When the pack 100 is in its initial position, the spout 10 is overwrapped and the communication to the outside of the pack is closed, for hygienic reasons. The pack shown in Figure 8 represents such an initial position. Once the secondary part 12 moves with respect to the primary part 11, the communication to the

outside of the pack 100 is opened and so the beverage or food product can be delivered.

[0025] Typically, as disclosed in EP 16184302.4, the content of the container 30 is typically a powder product that will be dissolved by the addition of water, in order to produce a food or beverage product.

[0026] Looking at Figure 1a, a piercing element (not shown) in the beverage dispensing device, typically configured as a needle, comes to pierce the flexible sheet overwrapping at least one of the piercing holes 13, 14: the piercing element in the device can also be configured as a double needle (two parallel needles) piercing at the same time both piercing holes 13, 14. The piercing element comes to pierce the flexible sheet over the piercing hole or holes 13, 14 and injects water at pressure that goes into the inner volume of the container 30 at high speed through the small injecting holes 17, 18: the configuration of the piercing holes leading internally to injecting holes of a very low diameter converts the high pressure water injected by the piercing element into one or two high velocity jets, which are driven into the container 30: the high velocity jets allow a good dissolution of the product inside the pouch, typically a powder. The beverage preparation device preferably fixes the spout 10 (in particular the primary part of it 11) by means of attaching holes 15, 16 as represented in Figure 1a. A connecting element 200 from the beverage preparation device is arranged to pierce the film or sheet overwrapping two displacing holes 21, 22: also, this connecting element 200 is configured to displace linearly downwards the secondary part 12 of the spout with respect to the primary part 11 that is typically fixed. Figure 1b shows the moment when the connecting element 200 in the preparation device pierces the displacing holes 21, 22 in the secondary part 12 of the spout. Figure 1c represents the position in which the secondary part 12 has been moved linearly downwards to its full travel with respect to the primary part 11 (in this position shown in Figure 1c, as it will be further described, the product can be delivered to the outside of the pack).

[0027] Figure 2a shows a further view of the connecting element 200 in the device in the moment when it is going to pierce the displacing holes 21, 22 in the secondary part 12 of the spout. Figure 2b shows in detail the two piercing elements 201, 202 in the connecting element 200 of the device configured, as previously described, to first pierce the film overwrapping the outside of the displacing holes 21, 22 and then arranged to move downwards the secondary part 12 of the spout with respect to the primary part 11 (typically fixed to the beverage preparation device). The communication from the inner volume of the container 30 towards the spout 10 and to the outside of it (to deliver the prepared product or beverage) is done by means of an outlet duct 23, as represented on top view (side inner volume of the container) in Figure 2b.

[0028] As described, the spout itself is composed of two injected plastic parts 11 and 12, which can be moved

(typically translated) with respect to each other. Typically, there are two movements of the device with respect to the spout and of the parts of the spout themselves, to achieve the following two functions: 1) piercing the flexible sheet overwrapping the frontal part of the spout (piercing the displacing holes 21, 22) during a first horizontal movement of the connecting element 200 towards the pack 100, and 2) opening and/or closing actively the product path through the outlet duct 23, during the product preparation process (typically a first vertical movement downwards of the secondary part 12 with respect to the primary part 11 piercing the lower flexible sheet overwrapping the lower side of the spout 10 to allow the dispensing of the food or beverage product prepared through the duct 23 and, once the dispensing has finished, the same movement but in opposite direction, upwards, to reclose the communication of the inner volume of the container 30 to the outside of the pack through the outlet duct 23, in order to avoid any dripping (this would be the final position when the pack 100 can be removed from the beverage preparation device).

[0029] The movement in horizontal (piercing function 1) described above) and in vertical (preparation process function 2) described above) of the connecting element 200 is carried out by a driving motor (not shown) in the beverage preparation device. The torque of the driving motor is proportional to the product of the force by the distance, and the motor current thus varies according to the load torque applied. Taking this into consideration, the driving motor torque presents a peak when the connecting element 200 has to pierce the flexible film or sheet overwrapping the front part of the displacing holes 21, 22 (i. e. when a certain resistance presented by this film needs to be overcome): this is represented in Figure 2c, by the position P_1 (when this piercing takes place) when the driving motor needs a higher torque T_1 . Measuring the motor current of the motor provides an image of the motor torque.

[0030] When the secondary part 12 of the spout 10 is moved downwards by the connecting element 200, the overwrapping flexible sheet that envelops the lower part of the spout 10 is tear open by an outlet piercing part 24 of the said outlet duct 23, as shown in detail in Figure 3a. By this downwards vertical movement of the secondary part 12, the communication of the inner volume of the container 30 towards the outlet duct 23 is made free (the upper positioning of the secondary part 23 in Figure 2b blocking the passage of the content of the container 30 to the outside of the pack) and also the wrapping sheet or film over the lower side of the spout 10 is tear open by the movement downwards of the outlet duct 23, being provided with an outlet piercing part 24 on one of its ends, as shown in detail in Figures 3a and 3b. Therefore, the beverage or food product prepared inside the pack can be dispensed through the outlet duct 23. In this case, the driving motor torque exerts a higher peak when the outlet piercing part 24 pierces or tears open the lower sheet over the spout 10. This higher torque peak is represented

by T_2 in Figure 3c, P_2 being the position when the outlet piercing part 24 pierces and tears open the flexible sheet.

[0031] Even when we described earlier the spout 10 with reference to Figures 1a-c, 2a-c, 3a-c, the spout 10 object of the invention is represented in detail in Figures 4a-d and Figures 5a-c, where the secondary part 12 of this spout comprises one or a plurality of transversal bumps 40 which are arranged in the horizontal path of the connecting element 200 when it displaces horizontally into the spout 10. Preferably (though not compulsory) the spout of the invention will further be provided with one or a plurality of vertical bumps 50 which are arranged on the primary part 11 of the spout 10 and are in the path of the vertical movement of the secondary part 12 with respect to the primary part 11. Further explanation of this will follow.

[0032] Figure 4d represents in detail a plurality of transversal bumps 40 arranged on the secondary part 12 of the spout 10, precisely located transversally through and into the displacing holes 21, 22, either in one of the displacing holes or in both of them. These transversal bumps 40 are located in the path followed by the connecting element 200 (particularly by its piercing elements 201, 202) when it comes to pierce the outer film covering frontally the spout 10 and advances transversally into the spout so that the piercing elements 201, 202 engage with the displacing holes 21, 22. When the transversal or horizontal movement of the connecting element 200 comes to an end, the piercing elements 201, 202 have correctly engaged with the displacing holes 21, 22 and the vertical movement downwards of the secondary part 12 of the spout with respect to the first part 11 (that remains fixed in the device) can take place.

[0033] These transversal bumps 40 represent obstacles placed at pre-defined locations along the travelling path of the connecting element 200 so it is possible to know the position of the said connecting element 200 of the device with respect to the spout 10. As described, one or both of the displacing holes 21, 22 can be provided with one or more transversal bumps 40, arranged on the travelling path of the piercing elements 201, 202 transversally into the spout 10. The shape of the piercing elements 201, 202 and the configuration of the spout (the transversal bumps 40 in the displacing holes 21, 22) are made complementary so the bumps 40 configure obstacles to the transversal advance of the piercing elements 201, 202. Therefore, these obstacles require higher torque values from the driving motor so every bump that is overcome in the advance of the piercing elements 201, 202 presents a peak of torque in the driving motor that can be monitored by measuring the current of the motor (i.e. the driving motor torque) along time.

[0034] With such a configuration, the graph torque and position obtained is similar as the one shown in Figure 4e: in the transversal movement (frontally piercing of the pack with the connecting element) there are several torque peaks represented by $T_1, T_2, T_3, T_4, T_5, \dots, T_n$, n being the number of transversal bumps 40, occurring at

positions or moments $P_1, P_2, P_3, P_4, P_5, \dots P_n$, respectively.

[0035] In a similar manner, one or a plurality of vertical bumps 50 can also be arranged on the primary part 11 of the spout, located in the vertical movement path that will be followed by the secondary part 12 of the spout with respect to the primary part 11. A detail is shown in Figure 5a where several bumps are arranged on the vertical path that will be followed by the secondary part 12, in particular by the displacing hole 21 (these vertical bumps 50 can be arranged on one vertical side or on both vertical sides of the secondary part 12 of the spout, in the path that will be followed by the displacing holes 21 and/or 22). Similar to what was explained for the transversal bumps 40, the vertical bumps 50 also present obstacles in the movement of the secondary part 12 with respect to the primary part 11. When the displacing hole or holes 21, 22 go over each one of the vertical bumps, a higher torque value from the driving motor is needed (that is, the current needed by the motor is higher).

[0036] Looking at Figure 5d, the vertical movement of the secondary part of the spout can be followed by the torque peaks: each torque peak $T_1, T_2, T_3, T_4, \dots T_n$, n being the number of bumps 50, corresponds to a bump 50 occurring at a position $P_1, P_2, P_3, P_4, \dots P_n$ respectively.

[0037] The complete transversal movement of the connecting element 200 for the engagement of the secondary part 12 of the spout and the movement for the vertical displacement of the secondary part of the spout with respect to the primary part while the preparation of the food or beverage product takes place is represented in Figure 6. This replaces a standard motor encoder.

[0038] Depending on the measurement resolution and on the spout design constraints, the number of peaks, their height and their width can be varied depending on the design made for the obstacles, that is, depending on the design made for the transversal bumps 40 and for the vertical bumps 50. Figures 7a, 7b and 7c represent exemplary design variations providing variations in the number, amplitude and period of the torque peaks with time.

[0039] The aim of the system of the invention is to encode information relating to the food or beverage product comprised in the pack 100 (precisely in the container 30) and information on the processing parameters (for example beverage volume, time, temperature, etc.) that need to be applied in a beverage preparation device for an optimal preparation of a food or beverage product from it. The information can be encoded digitally by attributing for example a value "1" to a torque peak (when there is a presence of a torque peak) and a value "0" for an absence of the said torque peak, as for example shown in Figure 9a. In the said Figure 9a, there are two transversal bumps 40 in the transversal movement of the connecting element 200 to engage with the spout 10 (there are two values "1" in the transversal path) and there are three vertical bumps 50 in the vertical displace-

ment of the secondary part 12 with respect to the primary part 11 (there are three values "1" in the vertical movement). A digital value can also be attributed to the height of the peak, the width of the peak or counting the number of peaks, in order to also encode the information needed for the product in the pack and/or for the processing parameters to be applied by the device. An example of this is shown in Figure 9b. By designing the number, height, width and arrangement of the bumps (transversal bumps 40 and/or vertical bumps 50) this encoding by attributing digital values to the torque peaks can be achieved.

[0040] As it will be explained in more detail now, the device will comprise a control unit that will monitor the motor current with time, during the preparation of a food or beverage product: this will translate into monitoring the value of the motor torque with time, so a graph similar to Figure 9a or to Figure 9b will be obtained. The control unit will therefore get a code or encoding that will provide the beverage preparation device the information on the type of product in the pack and the preparation parameters to be applied.

[0041] Therefore, in the system of the invention, the beverage preparation device will comprise a control unit (not shown) that will receive the data of the torque applied by the driving motor with time (i.e. when a beverage or food product is prepared from a pack): in fact, the control unit will receive the value of the motor current along time, that will be translated into torque value with time. The control unit will either attribute a value of "1" when a peak of torque takes place and a value of "0" when there is no torque peak, therefore receiving a digital code that will be associated to a type of product and/or processing parameters in the device, or the control unit will attribute a digital value to the height of a torque peak, the width of a torque peak and/or to the number of torque peaks detected, thus also obtaining a digital code that will be associated to a type of product and/or processing parameters in the device.

[0042] The control unit of the beverage preparation device in the system of the invention is configured to carry out the following method steps:

- it receives the value of the driving motor torque with time (in fact, the value of the current of the motor along time), during the preparation of the food or beverage product;
- it checks if a peak torque value takes place or not and/or checks the value of the peak torque and/or its width and/or the number of torque peaks taking place, and translates this into a digital code;
- the digital code is associated to a type of product and/or to processing parameters that will be applied by the device during the food or beverage product preparation.

Claims

1. Spout (10) comprising at least two parts (11, 12), **characterized in that** said parts are relatively moveable with respect to each other such that at least one of the two parts (11, 12) of the spout comprise means presenting a measurable resistance to being connected to an engaging part of a beverage preparation device and/or to the relative movement of the two parts (11, 12) of the spout, these means further comprising one or a plurality of indents or bumps (40, 50).
2. Spout (10) according to claim 1 wherein the presence or not of an indent or a bump (40, 50) is translated into binary format for configuring a code.
3. Spout (10) according to claim 1 wherein the profile of the indents or bumps define a digital value for configuring a code.
4. Pack (100) for preparing a food or beverage product comprising a spout (10) according to any of claims 1-3 and a container (30) configured to comprise a product to prepare the said food or beverage product, wherein the one or plurality of indents or bumps (40, 50) configure a code comprising the information on the product inside the container (30) and/or on the processing of the said product.
5. Pack (100) according to claim 4 wherein the container (30) is configured by at least one flexible film folded in order to shape an enclosed space where the food or beverage product is arranged.
6. Pack (100) according to claim 5 wherein the flexible film is configured overwrapping the spout (10) in its entirety except for the part of the spout which is in direct communication with the inner volume of the container (30).
7. Pack (100) according to any of claims 4-6 configured for allowing the injection of a fluid through the spout (10) and to create a jet inside the volume of the container (30) to prepare the food or beverage product.
8. System for preparing a food or beverage product comprising a pack (100) according to any of claims 4-7 comprising a product and a beverage preparation device that will introduce a fluid in the form of a jet inside the volume of the pack (100).
9. System according to claim 8 wherein the beverage preparation device comprises a control unit configured for measuring along time the resistance of the connection of the beverage preparation device to the spout (10) and the resistance of the relative movement of the two parts (11, 12) of the spout, determining a code, as a function of the bumps or indents, this code providing information on the type of food or beverage product in the pack (100) and on the parameters to process the product in the said pack.
10. System according to claim 9 wherein the beverage preparation device comprises a control unit configured for measuring along time, during the food or beverage preparation, the current provided by a driving motor driving the connection of the device to the spout (10) of the pack and also driving the movement of the two parts (11, 12) of the spout relative to each other, in order to determine the profile of the bumps or indents.
11. System according to claim 10 wherein the control unit is configured to transform the current value of the driving motor into a motor torque or a resistance force value along time, during the food or beverage preparation, in order to determine the profile of the bumps or indents.
12. System according to any of claims 8-11 wherein the code is an analog format or a digital format.
13. Method for preparing a food or beverage product from a pack (100) in a system according to any of claims 8-12, comprising the steps of:
 - monitoring along time the resistance of the connection of the device to the spout (10) of the pack (100) and also the resistance of the relative movement of the two parts (11, 12) of the spout;
 - configuring a code with the said monitored resistance along time;
 - using the information of the said code and applying the process parameters corresponding to the said code read for preparing the corresponding food or beverage product in the pack (100).
14. Method according to claim 13 wherein the resistance of the connection of the device to the spout (10) of the pack (100) and also the resistance of the relative movement of the two parts (11, 12) of the spout is measured by monitoring the current from the driving motor driving the connection to the spout (10) and the relative movement of the two parts (11, 12) of the spout (10).
15. Method according to any of claims 13-14 wherein the process parameters comprise one or a combination of: flow of fluid introduced in the spout (10), total volume of fluid introduced, temperature of the fluid, processing time, delivery time.

Patentansprüche

1. Ausguss (10), umfassend mindestens zwei Teile

- (11, 12), **dadurch gekennzeichnet, dass** die Teile relativ zueinander beweglich sind, sodass mindestens einer der beiden Teile (11, 12) des Ausgusses Mittel umfasst, die einen messbaren Widerstand gegen die Verbindung mit einem Eingriffsteil einer Getränkezubereitungs Vorrichtung und/oder gegen die relative Bewegung der beiden Teile (11, 12) des Ausgusses aufweisen, diese Mittel ferner umfassend eine oder eine Vielzahl von Vertiefungen oder Unebenheiten (40, 50).
2. Ausguss (10) nach Anspruch 1 wobei das Vorhandensein oder Nichtvorhandensein einer Vertiefung oder einer Unebenheit (40, 50) in ein binäres Format für eine Konfiguration eines Codes übersetzt wird.
 3. Ausguss (10) nach Anspruch 1 wobei das Profil der Vertiefungen oder Unebenheiten einen digitalen Wert zum Konfigurieren eines Codes definiert.
 4. Packung (100) zum Vorbereiten eines Lebensmittel- oder Getränkeprodukts, umfassend einen Ausguss (10) nach einem der Ansprüche 1 bis 3 und einen Behälter (30), der so konfiguriert ist, dass er ein Produkt umfasst, um das Lebensmittel- oder Getränkeprodukt vorzubereiten, wobei die eine oder die Vielzahl von Vertiefungen oder Unebenheiten (40, 50) einen Code konfigurieren, umfassend die Informationen über das Produkt im Inneren des Behälters (30) und/oder über die Verarbeitung des Produkts
 5. Packung (100) nach Anspruch 4 wobei der Behälter (30) durch mindestens eine flexible Folie konfiguriert ist, die gefaltet ist, um einen umschlossenen Raum bildet, in dem das Lebensmittel- oder Getränkeprodukt angeordnet ist.
 6. Packung (100) nach Anspruch 5, wobei die flexible Folie so konfiguriert ist, dass sie den Ausguss (10) in seiner Gesamtheit umhüllt, mit Ausnahme des Teils des Ausgusses, der in direkter Verbindung mit dem Innenvolumen des Behälters (30) steht.
 7. Packung (100) nach einem der Ansprüche 4 bis 6, die zum Ermöglichen des Einspritzens einer Flüssigkeit durch den Ausguss (10) konfiguriert ist und um einen Strahl im Inneren des Volumens des Behälters (30) zu erzeugen, um das Lebensmittel- oder Getränkeprodukt zuzubereiten.
 8. System zum Zubereiten eines Lebensmittel- oder Getränkeprodukts, umfassend eine Packung (100) nach einem der Ansprüche 4 bis 7, umfassend ein Produkt und eine Getränkezubereitungs Vorrichtung, die eine Flüssigkeit in der Form eines Strahls im Inneren des Volumens der Packung (100) einführt.
 9. System nach Anspruch 8, wobei die Getränkezubereitungs Vorrichtung eine Steuereinheit umfasst, die zum Messen, im Laufe der Zeit, des Widerstands der Verbindung der Getränkezubereitungs Vorrichtung mit dem Ausguss (10) und des Widerstands der relativen Bewegung der beiden Teile (11, 12) des Ausgusses, zum Bestimmen eines Codes in Abhängigkeit von den Unebenheiten oder Vertiefungen konfiguriert ist, wobei dieser Code Informationen über die Art des Lebensmittel- oder Getränkeprodukts in der Packung (100) und über die Parameter, um das Produkt in der Packung zu verarbeiten, liefert
 10. System nach Anspruch 9, wobei die Getränkezubereitungs Vorrichtung eine Steuereinheit umfasst, die zum Messen, im Laufe der Zeit, während der Zubereitung von Lebensmitteln oder Getränken, des Stroms, der durch einen Antriebsmotor geliefert wird, der die Verbindung der Vorrichtung mit dem Ausguss (10) der Packung antreibt und auch die Bewegung der beiden Teile (11, 12) des Ausgusses relativ zueinander antreibt, um das Profil der Unebenheiten oder Vertiefungen zu bestimmen.
 11. System nach Anspruch 10 wobei die Steuereinheit so konfiguriert ist, dass sie, im Laufe der Zeit, den Stromwert des Antriebsmotors in ein Motordrehmoment oder einen Widerstandskraftwert, während der Zubereitung des Lebensmittels oder Getränks, umwandelt, um das Profil der Unebenheiten oder Vertiefungen zu bestimmen.
 12. System nach einem der Ansprüche 8 bis 11 wobei der Code ein analoges Format oder ein digitales Format ist.
 13. Verfahren zum Zubereiten eines Lebensmittel- oder Getränkeprodukts aus einer Packung (100) in einem System nach einem der Ansprüche 8 bis 12, umfassend die Schritte:
 - Überwachen, im Laufe der Zeit, des Widerstands der Verbindung der Vorrichtung mit dem Ausguss (10) der Packung (100) und auch des Widerstands der relativen Bewegung der beiden Teile (11, 12) des Ausgusses;
 - Konfigurieren eines Codes mit dem überwachten Widerstand im Laufe der Zeit;
 - Verwenden der Informationen des Codes und Anwenden der Prozessparameter, die dem Code entsprechen, der zum Zubereiten des entsprechenden Lebensmittel- oder Getränkeprodukts in der Packung (100) gelesen wird.
 14. Verfahren nach Anspruch 13, wobei der Widerstand der Verbindung der Vorrichtung mit dem Ausguss (10) der Packung (100) und auch der Widerstand der relativen Bewegung der beiden Teile (11, 12) des Ausgusses durch Überwachen des Stroms vom

Antriebsmotor, der die Verbindung mit dem Ausguss (10) antreibt, und der relativen Bewegung der beiden Teile (11, 12) des Ausgusses (10) gemessen wird.

15. Verfahren nach einem der Ansprüche 13 bis 14, wobei die Prozessparameter eines oder eine Kombination umfassen von: Durchfluss der in den Ausguss (10) eingeführten Flüssigkeit, Gesamtvolumen der eingeführten Flüssigkeit, Temperatur der Flüssigkeit, Verarbeitungszeit, Abgabezeit.

Revendications

1. Bec (10) comprenant au moins deux parties (11, 12), **caractérisé en ce que** lesdites parties sont relativement mobiles l'une par rapport à l'autre de telle sorte qu'au moins l'une parmi les deux parties (11, 12) du bec comprend un moyen présentant une résistance mesurable pour être reliée à une partie de prise d'un dispositif de préparation de boisson et/ou au mouvement relatif des deux parties (11, 12) du bec, ce moyen comprenant en outre une ou une pluralité d'indentations ou de bosses (40, 50).
2. Bec (10) selon la revendication 1, dans lequel la présence ou non d'une indentation ou d'une bosse (40, 50) est traduite en format binaire pour configurer un code.
3. Bec (10) selon la revendication 1, dans lequel le profil des indentations ou bosses définit une valeur numérique pour configurer un code.
4. Paquet (100) destiné à la préparation d'un produit alimentaire ou de boisson comprenant un bec (10) selon l'une quelconque des revendications 1 à 3 et un récipient (30) conçu pour comprendre un produit pour préparer ledit produit alimentaire ou de boisson, dans lequel la ou les indentations ou bosses (40, 50) configurent un code comprenant les informations sur le produit à l'intérieur du récipient (30) et/ou sur le traitement dudit produit.
5. Paquet (100) selon la revendication 4, dans lequel le récipient (30) est conçu par au moins un film souple plié afin de former un espace clos où le produit alimentaire ou de boisson est agencé.
6. Paquet (100) selon la revendication 5, dans lequel le film souple est conçu de manière à recouvrir le bec (10) dans sa totalité à l'exception de la partie du bec qui est en communication directe avec le volume interne du récipient (30).
7. Paquet (100) selon l'une quelconque des revendications 4 à 6 conçu pour permettre l'injection d'un fluide à travers le bec (10) et pour créer un jet à

l'intérieur du volume du récipient (30) pour préparer le produit alimentaire ou de boisson.

8. Système de préparation d'un produit alimentaire ou de boisson comprenant un paquet (100) selon l'une quelconque des revendications 4 à 7 comprenant un produit et un dispositif de préparation de boisson qui introduira un fluide sous forme de jet à l'intérieur du volume du paquet (100).
9. Système selon la revendication 8, dans lequel le dispositif de préparation de boisson comprend une unité de commande configurée pour mesurer dans le temps la résistance de la liaison du dispositif de préparation de boisson au bec (10) et la résistance du mouvement relatif des deux parties (11, 12) du bec, la détermination d'un code, en fonction des bosses ou des indentations, ce code fournissant des informations sur le type de produit alimentaire ou de boisson dans le paquet (100) et sur les paramètres pour traiter le produit dans ledit paquet.
10. Système selon la revendication 9, dans lequel le dispositif de préparation de boisson comprend une unité de commande configurée pour mesurer dans le temps, pendant la préparation alimentaire ou de boisson, le courant fourni par un moteur d'entraînement entraînant la liaison du dispositif au bec (10) du paquet et entraînant également le mouvement des deux parties (11, 12) du bec l'une par rapport à l'autre, afin de déterminer le profil des bosses ou des indentations.
11. Système selon la revendication 10, dans lequel l'unité de commande est configurée pour transformer la valeur actuelle du moteur d'entraînement en un couple moteur ou une valeur de force de résistance dans le temps, pendant la préparation d'aliments ou de boissons, afin de déterminer le profil des bosses ou des indentations.
12. Système selon l'une quelconque des revendications 8 à 11, dans lequel le code est un format analogique ou un format numérique.
13. Procédé de préparation d'un produit alimentaire ou de boisson à partir d'un paquet (100) dans un système selon l'une quelconque des revendications 8 à 12, comprenant les étapes consistant à :
 - surveiller dans le temps la résistance de la liaison du dispositif au bec (10) du paquet (100) et également la résistance du mouvement relatif des deux parties (11, 12) au bec ;
 - configurer un code avec ladite résistance surveillée dans le temps ;
 - utiliser les informations dudit code et appliquer les paramètres de processus correspondant

audit code lu pour la préparation du produit alimentaire ou de boisson correspondant dans le paquet (100).

14. Procédé selon la revendication 13, dans lequel la 5
résistance de la liaison du dispositif au bec (10) du
paquet (100) et également la résistance du mouve-
ment relatif des deux parties (11, 12) du bec est me-
surée en surveillant le courant provenant du moteur
d'entraînement entraînant la liaison au bec (10) et 10
le mouvement relatif des deux parties (11, 12) du
bec (10).
15. Procédé selon l'une quelconque des revendications 13 à 14, dans lequel les paramètres de processus 15
comprennent un ou une combinaison : d'un écoule-
ment de fluide introduit dans le bec (10), d'un volume
total de fluide introduit, d'une température du fluide,
d'un temps de traitement, d'un temps de distribution. 20

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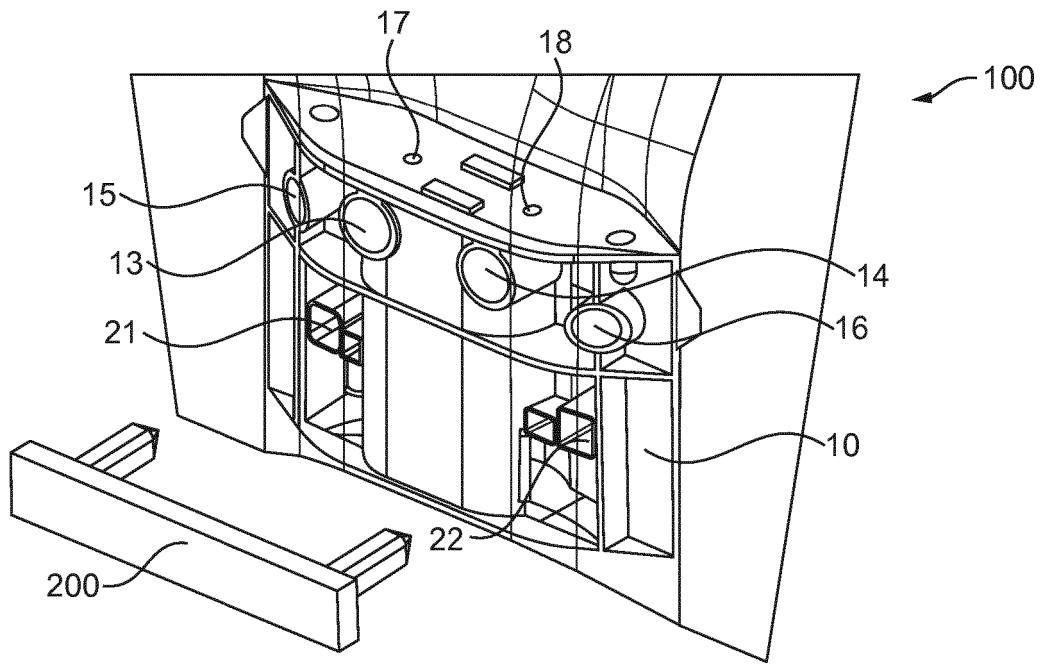


FIG. 1A

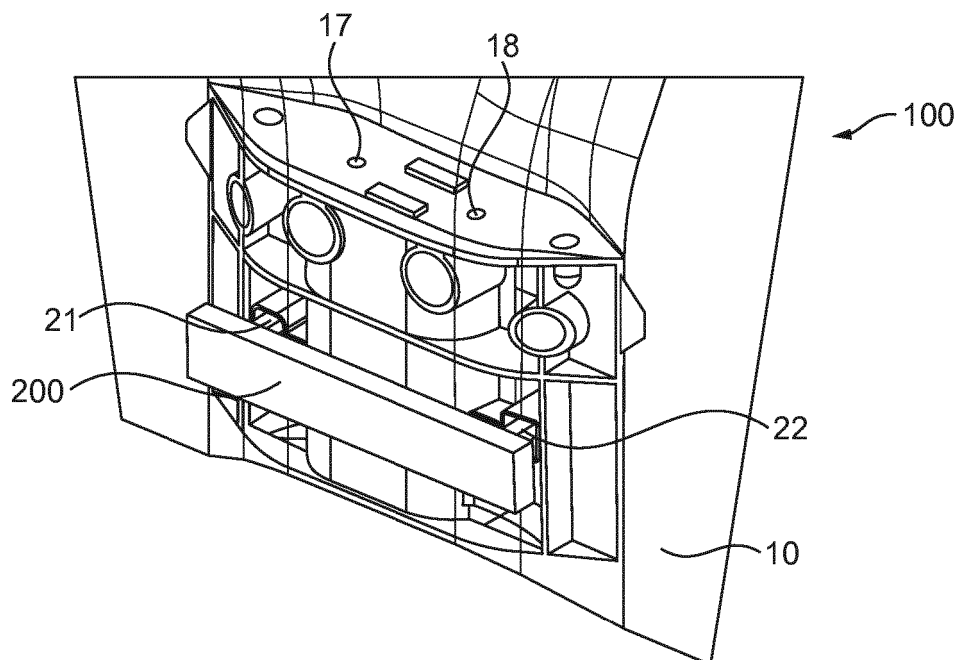


FIG. 1B

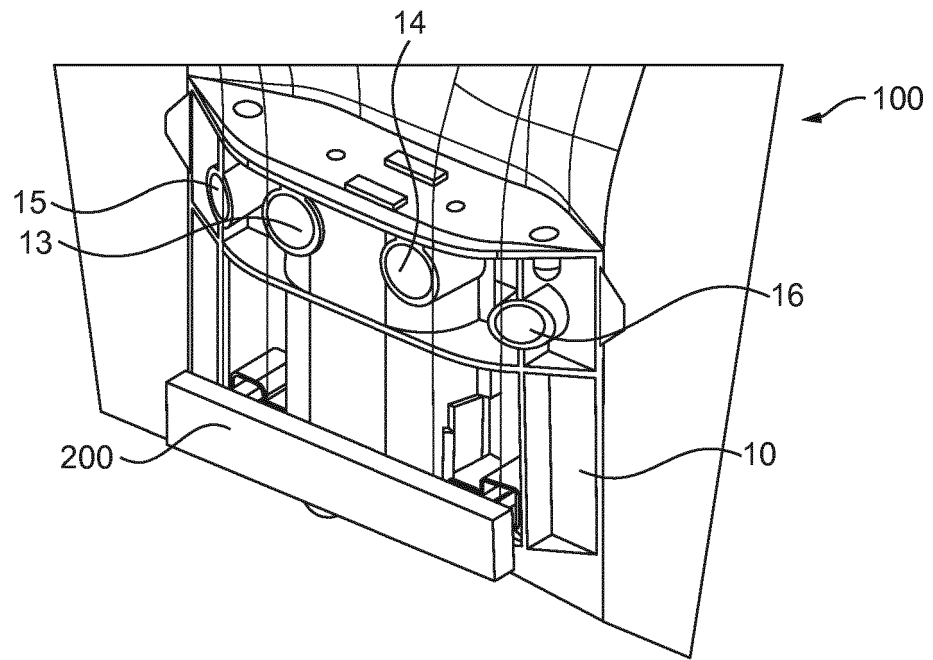


FIG. 1C

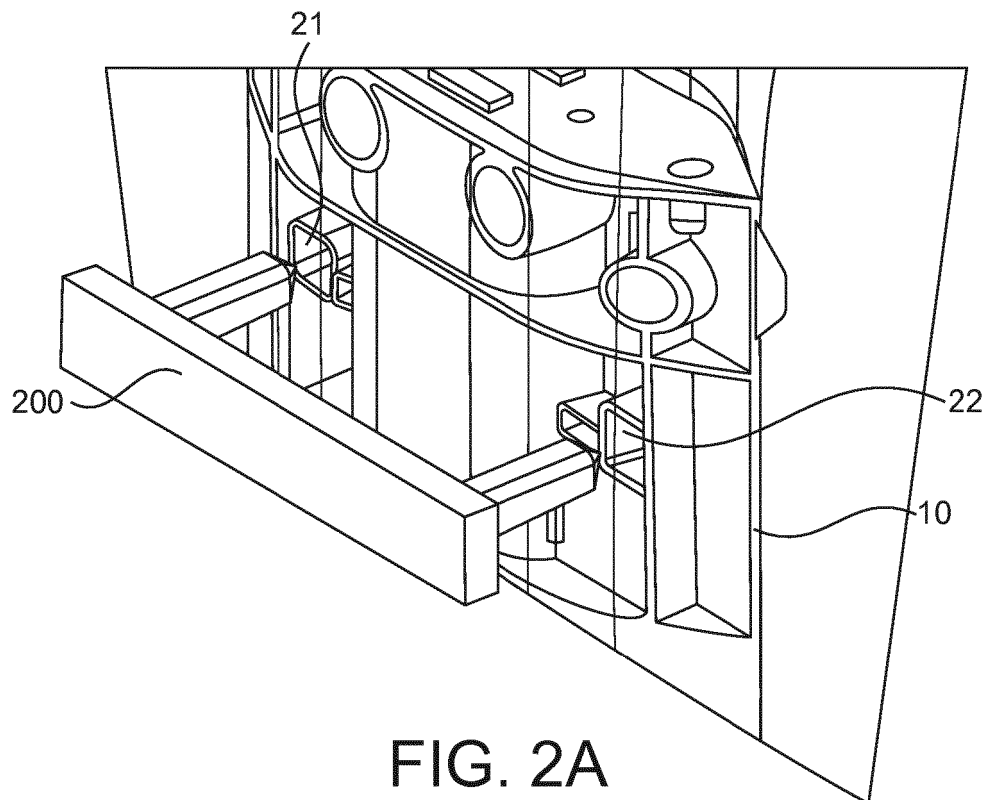


FIG. 2A

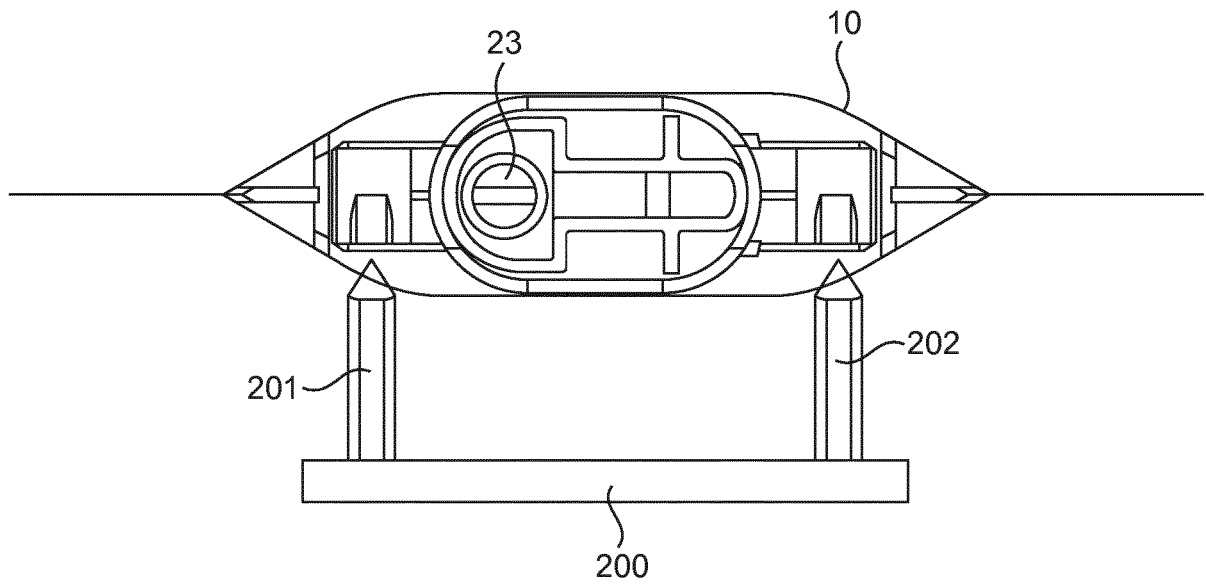


FIG. 2B

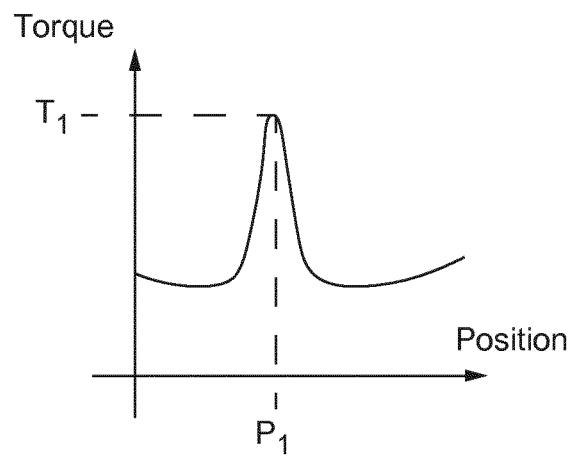


FIG. 2C

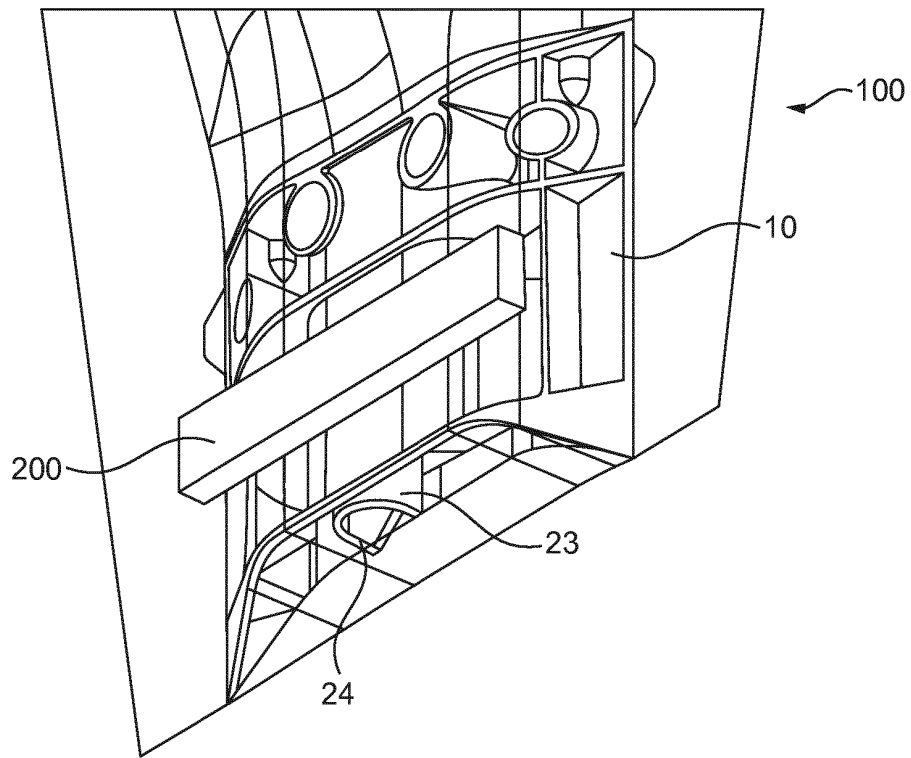


FIG. 3A

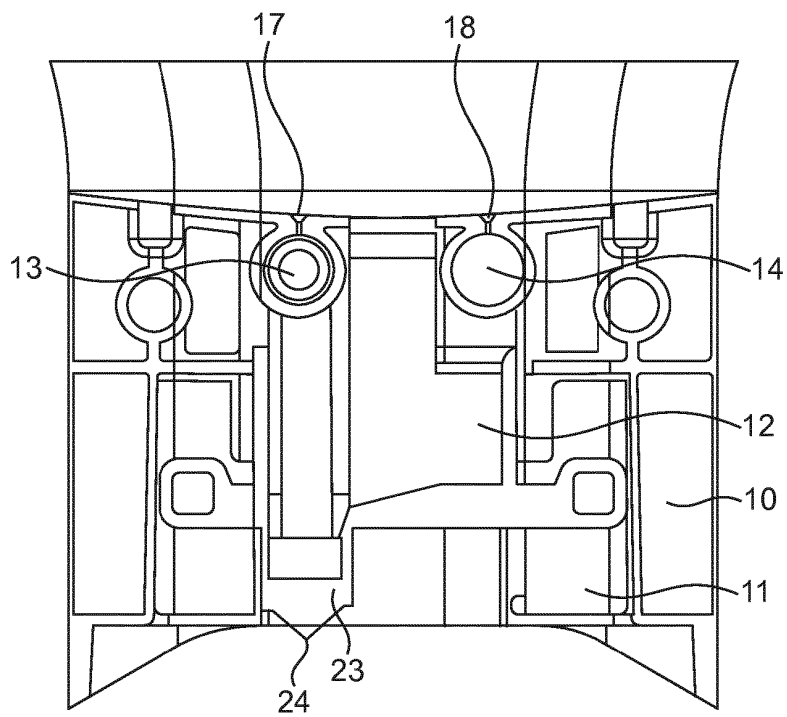


FIG. 3B

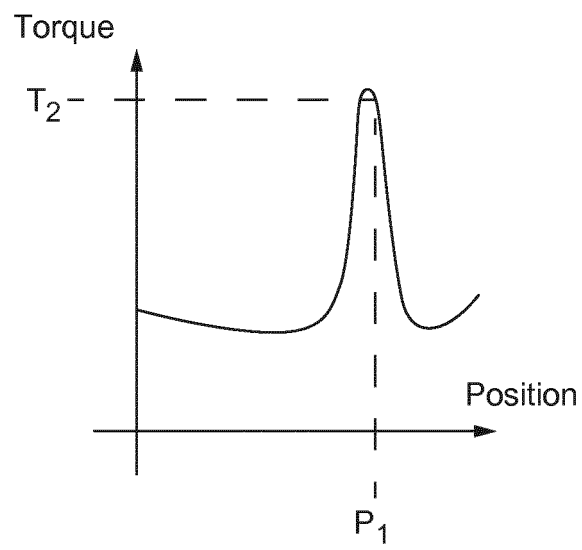


FIG. 3C

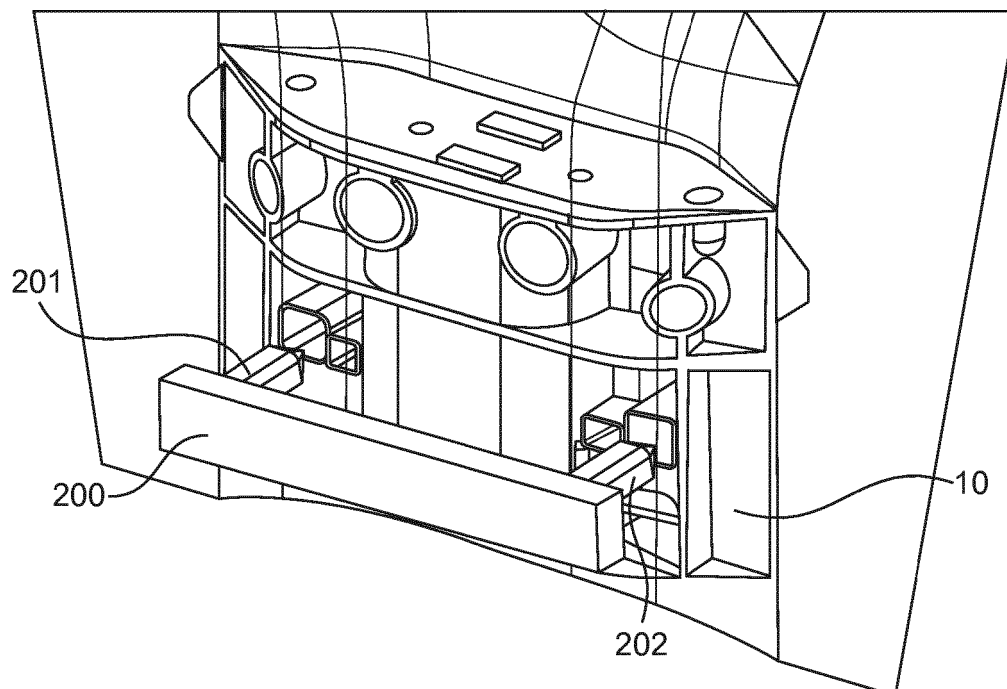


FIG. 4A

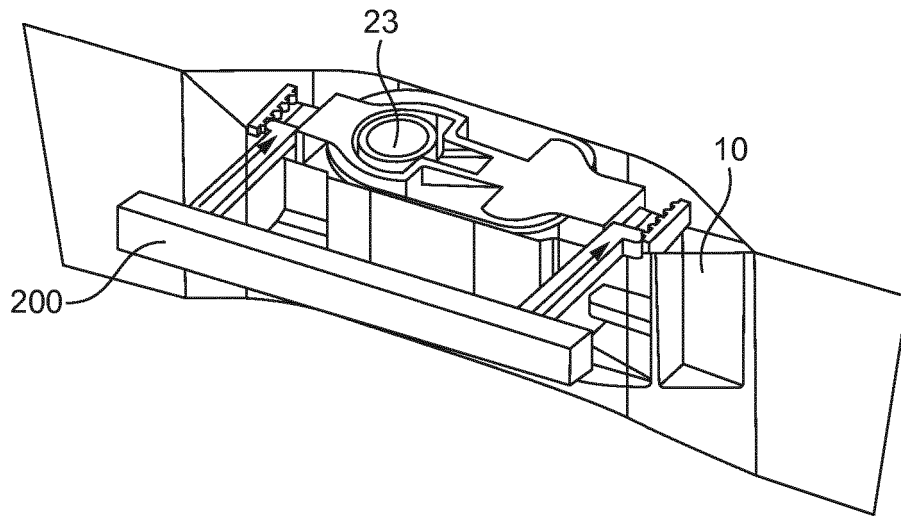


FIG. 4B

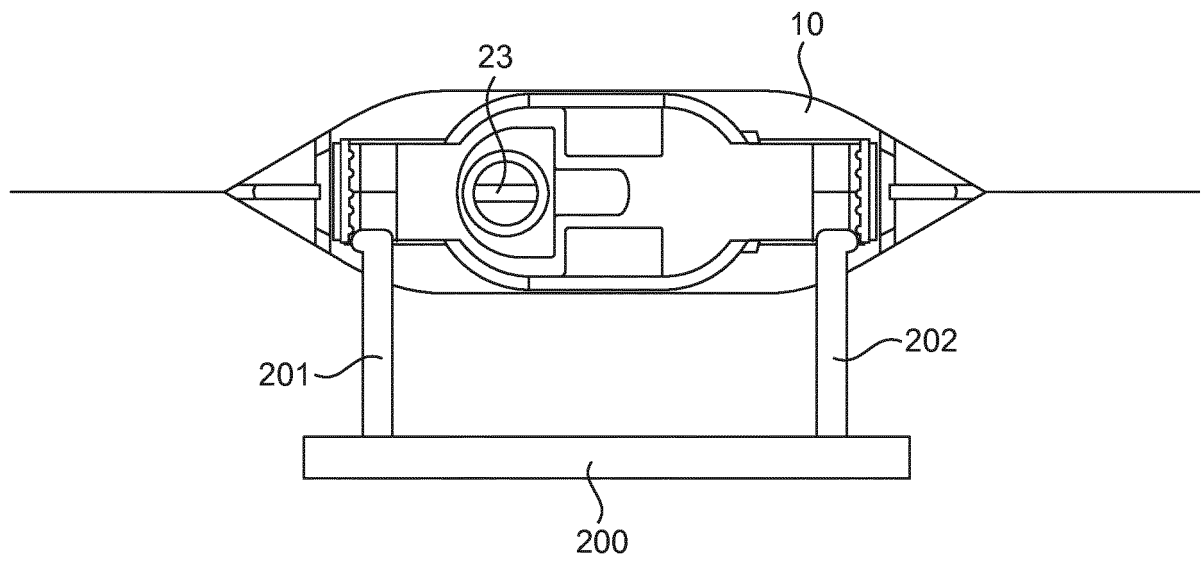


FIG. 4C

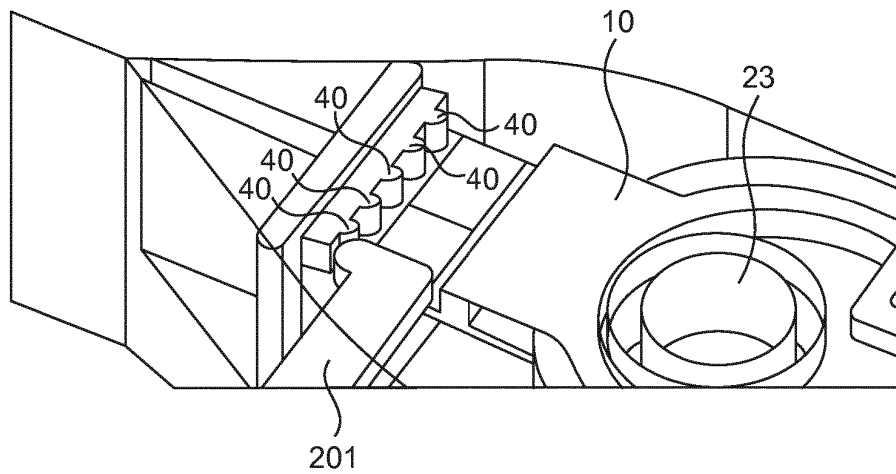


FIG. 4D

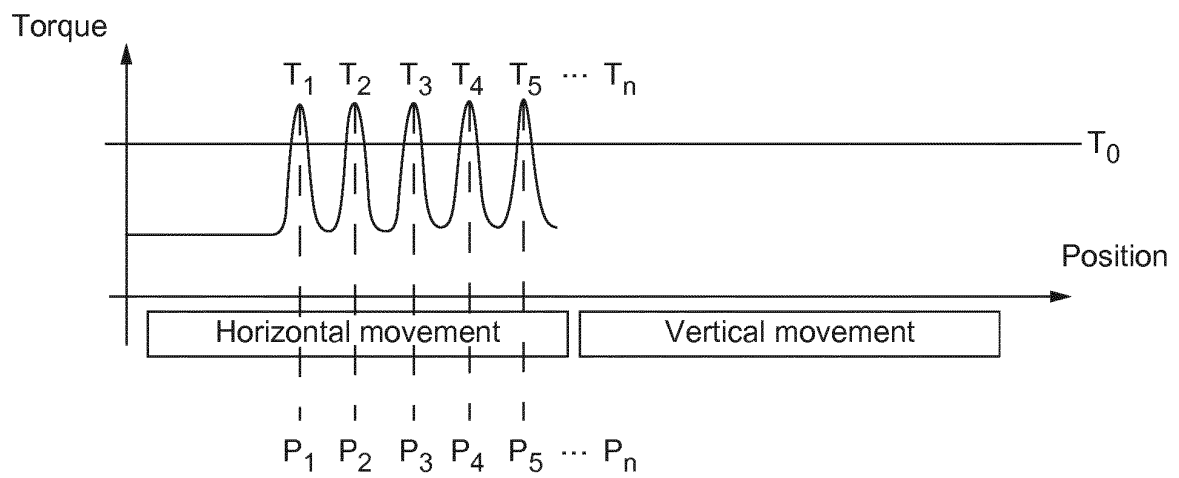


FIG. 4E

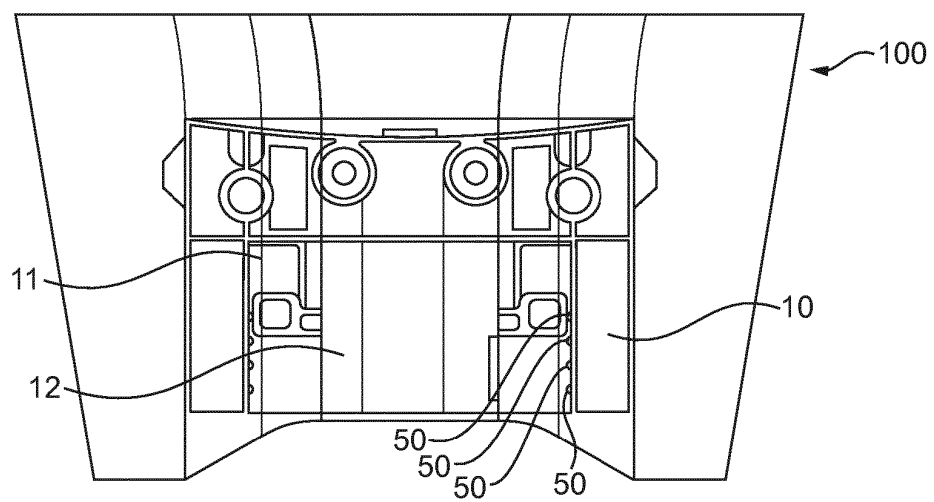


FIG. 5A

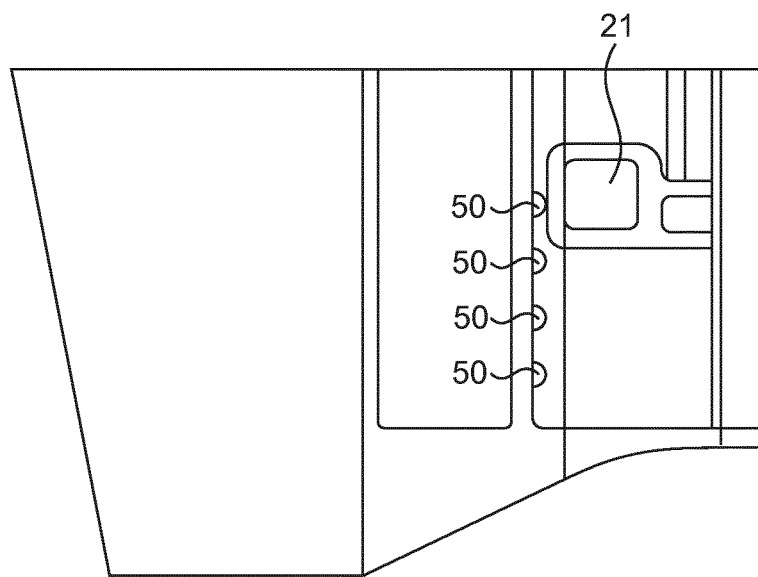


FIG. 5B

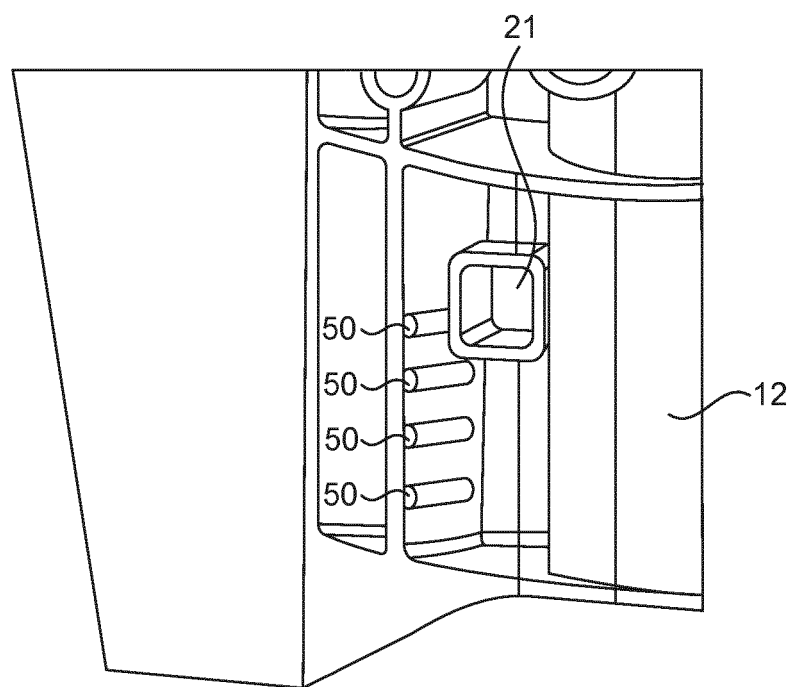


FIG. 5C

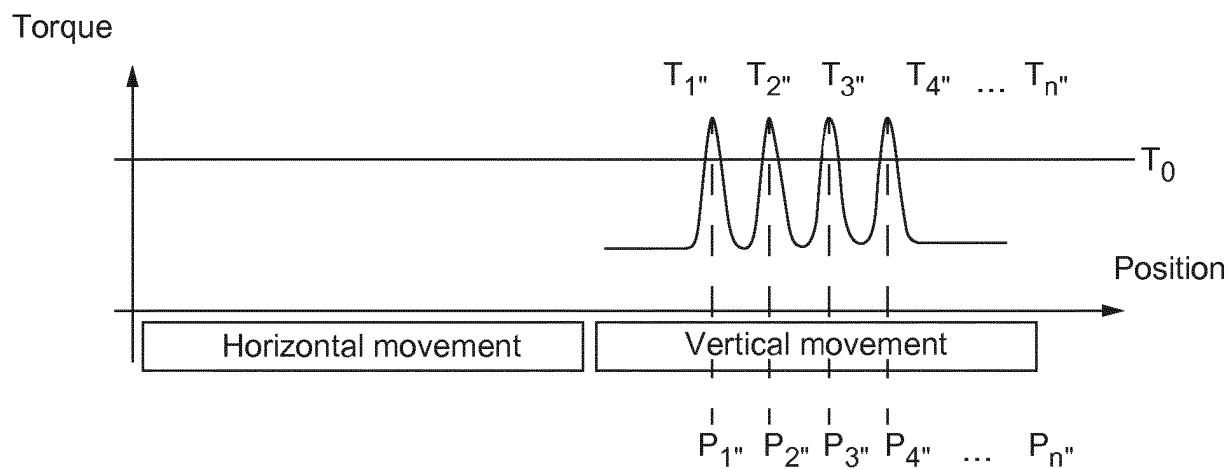


FIG. 5D

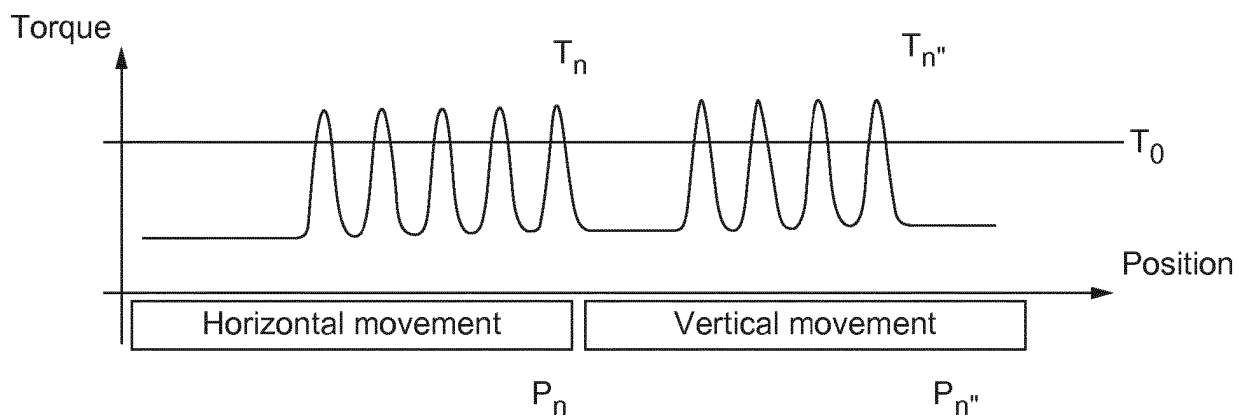


FIG. 6

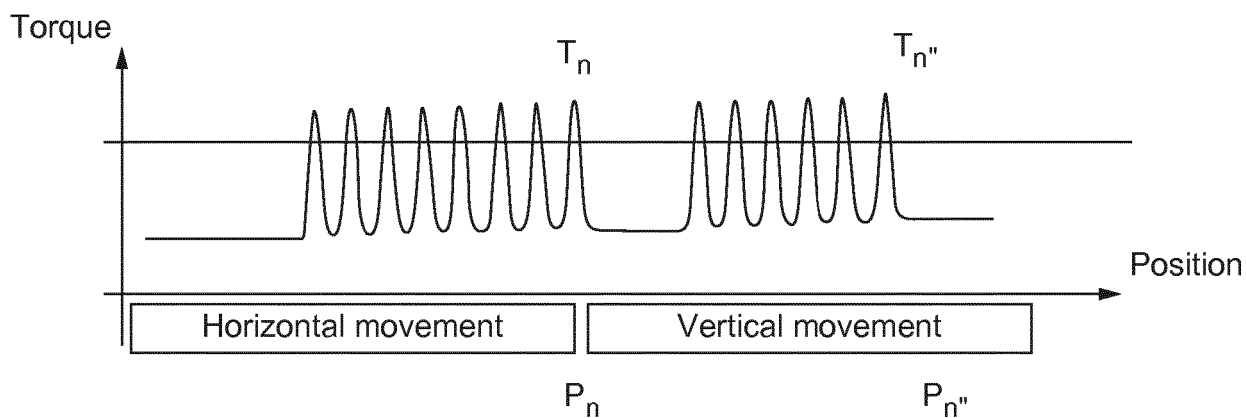


FIG. 7A

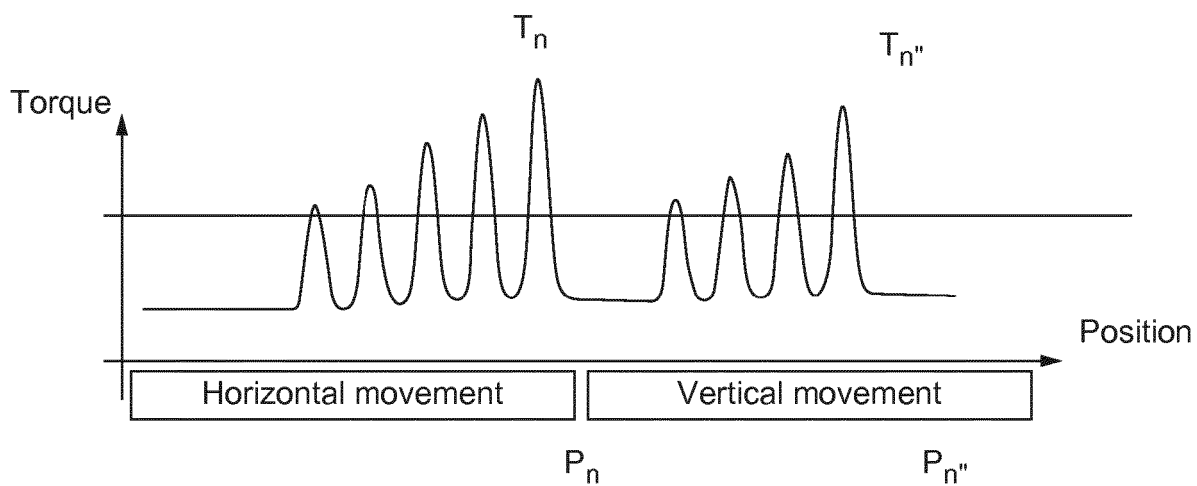


FIG. 7B

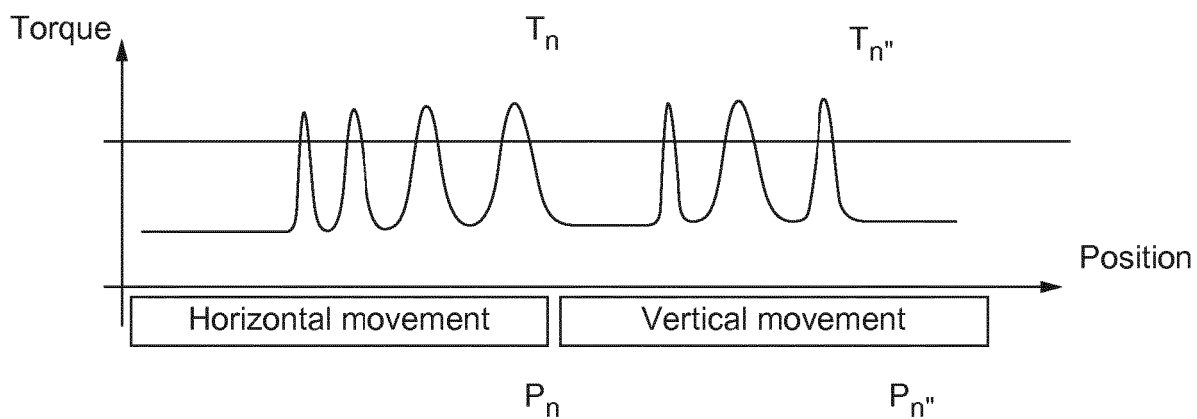


FIG. 7C

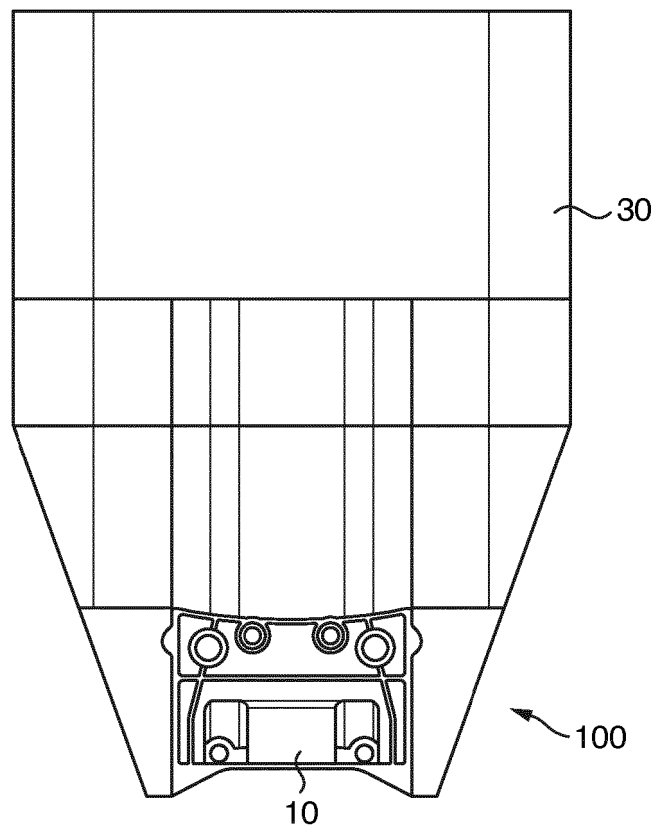


FIG. 8

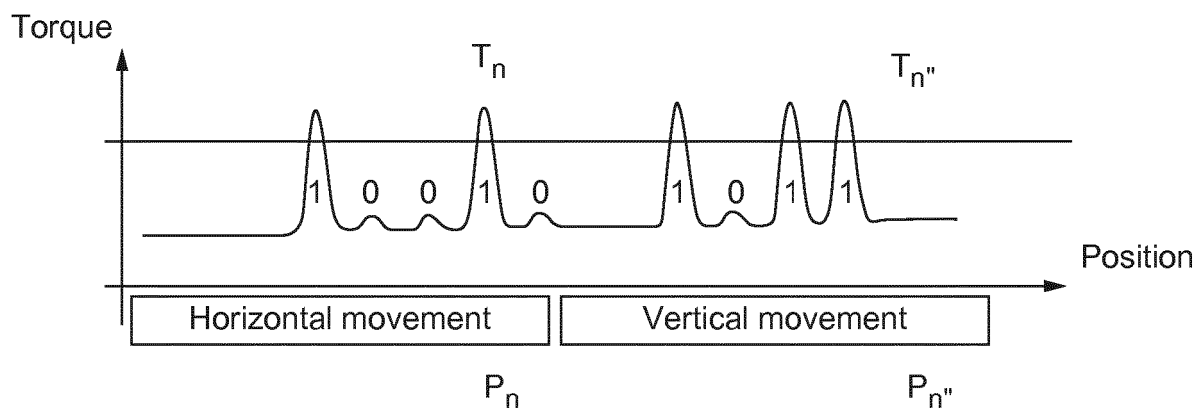


FIG. 9A

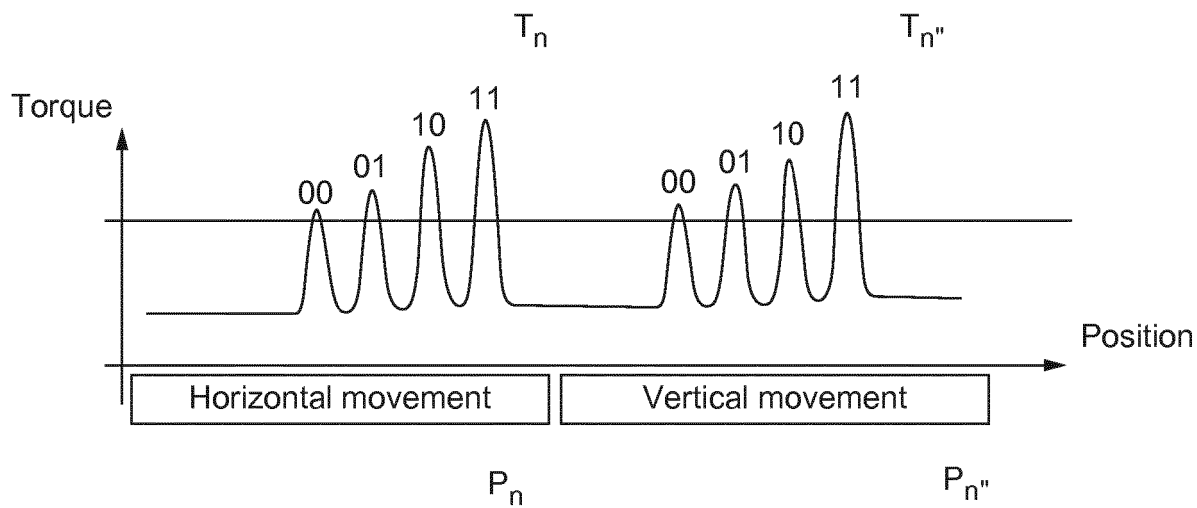


FIG. 9B

REFERENCES CITED IN THE DESCRIPTION

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- EP 16184302 [0005] [0024] [0025]