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(54) **A labelling apparatus for labelling items while the items are conveyed by a conveyor means**

(57) Labelling apparatus (200) for labelling items (211) while the items (211) are conveyed by a conveyor means (212). A label feeder (201) is provided adapted for feeding self adhesive labels (206) along a first path (208), and at least two applicators (202, 203) are provided each of which including a label carrying mechanism (204, 205) at its distal end, the at least two applicators being adapted to receive a label (206) supplied by the label feeder (201) and move the received label (206) along a second path (209, 210) towards a labelling position where labelling an item (211) takes place, where the at least two applicators (202, 203) are arranged essentially perpendicular to the first path (208) such that when receiving the label (206) the at least two applicators (202, 203) are arranged along the label (206) when moving the received label (206) towards the labelling position.

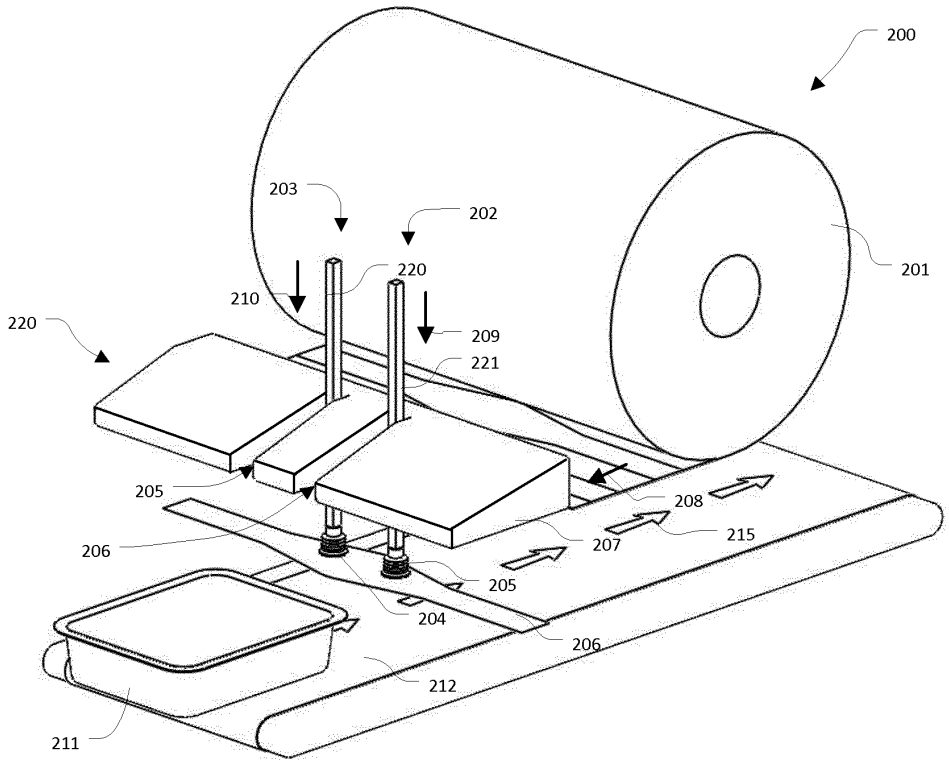

FIG. 2a

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a labelling apparatus for labelling items while the items are conveyed by a conveyor means and to a method for labelling items using the labelling apparatus.

BACKGROUND OF THE INVENTION

[0002] Labelling devices that are capable of automatically labelling food items or packages have existed for the last decades.

[0003] EP1118542 discloses a method for labelling products that are sold with a sleeve-type product identification band or wrapping member which serves to encircle or wrap around a product. An example of such a labelling is depicted figure 1 showing a perspective view and a front view of an item 103 resting in a tray 102 that has been labelled by a prior art labelling apparatus. An oblong label 101 extends across the item where the "wing-shaped" end parts of the oblong label are subsequently wrapped around the item as indicated by the arrows so that it fully encircles the item 103 and the tray 101. This type of labelling is often referred to as D-wrapped labelling.

[0004] The problem with prior art methods/devices that are capable of carrying out such a D-wrapped labelling is that an empty space 104a,b is formed when the items to be packed have irregular shape, such as shown figure 1. Such an empty space may easily cause that the label may accidentally be torn apart when e.g. a customer picks up the item, which obviously makes the appearance of the item less attractive.

SUMMARY OF THE INVENTION

[0005] On the above background it is an object of the present invention to provide a labelling device that is capable of automatically labelling items having uneven and complex shapes/surfaces in a way that the risk of accidentally torn the label apart is eliminated, where the label may as an example include sleeve-type product identification band or wrapping member which serves to encircle or wrap around a product so that it at least partly encircles the item.

[0006] Embodiments of the invention preferably seeks to mitigate, alleviate or eliminate one or more of the above mentioned disadvantages of the prior art singly or in any combination. In particular, it may be seen as an item of embodiments of the present invention to provide a labelling apparatus that solves the above mentioned problems, or other problems.

[0007] To better address one or more of these concerns, in a first aspect of the invention a labelling apparatus is provided for labelling items while the items are conveyed by a conveyor means, comprising:

- a label feeder adapted for feeding self adhesivelabels along a first path, and
- at least two applicators each of which comprising a label carrying mechanism at its distal end, the at least two applicators being adapted to receive a label supplied by the label feeder and move the received label along a second path towards a labelling position where labelling an item takes place, where the at least two applicators are arranged essentially perpendicular to the first path such that when receiving the label the at least two applicators are arranged along the label when moving the received label towards the labelling position.

[0008] Accordingly, the fact that two or more applicators aligned along the label are utilized to put the label onto the items it is possible to adapt the label to uneven surfaces such that the label becomes fully aligned with the surfaces leaving no empty spaces beween the items and the labels. The risk of accidentally torn the label apart when e.g. customers picks up an item is thus eliminated. Furthermore, the label area that exposes the item becomes larger which leaves larger printing area on the label.

[0009] Also, items having convex or round shaped profile, e.g. a chicken resting on a substantially flat tray, may be labelled with e.g. an oblong label which shape may be adapted to the item to be shaped, where a long side of the label might, in case the item is a chicken, in this particular case have a concave shape. Thus, the label may be attached to the substantially flat tray and e.g. partly surround at least a part of the periphery of the item.

[0010] The labels may have all types of shape and may as an example be oblong labels that are adapted to be mounted to the items in a sleeve or sleeve-simulating format which serves to encircle or wrap at least partly around the items. The items may include any type of food items in trays, e.g. trays having bottom and side walls or trays that are substantially flat or have a dish-format, and where the labels may be adapted to fully encircle the items (often referred to as D-wrap) and the trays, or e.g. to encircle only the top and bottom and one side of the items in the trays (often referred to as C-wrap). The food items are typically sealed before being labelled with any type of sealant material, e.g. a sealant film.

[0011] The present invention is not limited to any particular shape of labels, e.g. should not be construed to be limited to the above mentioned shape, but any type of shapes is possible.

[0012] In one embodiment, the first path is a substantially horizontal path and the second path is substantially a path vertical to the first path.

[0013] In one embodiment, the internal arrangment of the at least two applicators is adapted to the shape of the items to be labelled. It may thus be ensured that the labelling fits perfectly to the surfaces of the items to be labeled.

[0014] In one embodiment, the number of the at least

two applicators is adapted to the shape of the items to be labelled and/or the surface area of the items to be labelled.

[0015] The number of applicators may thus be minimized, depending to the application. If as an example the item is in a tray (containing e.g. any type of food or ready meal) having an upper U-shaped form, it may be sufficient to use only two applicators having an internal arrangement such that the label, in this case typically an oblong label, fully follows the U-shaped form.

[0016] In one embodiment, the at least two applicators are arranged along the label in two or more rows arranged along the label such that the two or more rows form a matrix like arrangement of applicators. This may as an example be of relevance when the label has such large width where a single raw of two or more applicators is not sufficient to either hold the label, and/or where the labelling surface has such a complex geometry that more than a single row of applicators is needed to align the label to the shape of the item. Accordingly, by utilizing such a matrix like arrangement of applicators the labelling may be completed on all types of surfaces.

[0017] In one embodiment, each of the at least two applicators comprises:

- a linearly displaceable piston having the label carrying mechanism attached to its distal end, the piston being operable connected to a moving mechanism for moving the piston from a resting position to the labelling position,
- a force-switching-state system operable to maintain the piston in relation to the moving mechanism in an attracting force state such that the piston moves with the moving mechanism to the labelling position, where at the labelling position the label carrying mechanism exerts with a physical contact with the item, where the physical contact with the item creates an opposite repelling force from the item onto the labelling carrying mechanism causing a separation between the displaceable piston from the moving mechanism, where the separation causes a change of the force state of the piston from being in an attracting force state to a repelling force stage causing the piston to move back to the resting position.

[0018] In one embodiment, the force-switching-state system comprises:

- a piston magnet rigidly fixed to the piston,
- a fixed magnet positioned distally away from the labelling carrying mechanism at a position defining the resting position,
- a drive coupling housing circumferentially surrounding the piston in a linear slidable manner attached to the moving mechansim, the drive coupling housing having an cavity facing the fixed magnet, the drive coupling housing comprising means for generating a localized magnetic field within the cavity so as to provide an attractive magnetic force on the piston magnet when the piston magnet is positioned in the cavity defining the attractive force state,

  wherein the displacement of the piston from the resting position, where the drive coupling housing is positioned adjacent to the fixed magnet with the piston magnet placed there between, towards the labelling position is based on movement of the moving mechanism and thus linear movement of the drive coupling housing, the attractive magnetic force on the piston magnet causing a simultaneous linear movement of the piston from the resting position to the labelling position.

[0019] The fact that the labelling carrying mechanism comes into physical contact with the item the risk that the labels will be blown away from the item is prevented. Also, by utilizing the repelling force as a kind of a "trigger" to switch the force-switching-state from being in a attracting force state to a repulsing force state causing the displaceable piston to automatically move back to the resting position provides an effective way is provided to return the piston back to the resting position where it is ready to label the forthcoming items.

[0020] In one embodiment, the labelling apparatus further comprises a holding station adapted to receive and hold the label prior to be received by the at least two applicators.

[0021] In one embodiment, the holding station comprises an outwardly protruding structure positioned downstream in relation to a moving direction of the label feeder, where the outwardly protruding structure comprises a holding side facing the conveyor means, where outwardly protruding structure is positioned at a height level in relation the received label such that the holding side is positioned at substantially same height level or slightly above the height level of the received label, and where the outwardly protruding structure is operable connected to a means for providing a holding force between the label and the holding side so as to temporarily holding the label. Thus, a secured and a reliable solution is provided to ensure that the label and the subsequent labels are temporarily hold in a secured and reliable way before being removed by the at least two applicators.

[0022] In one embodiment, the outwardly protruding structure comprises two or more slits at the distal end of the outwardly protruding structure, the internal arrangment of the slits being such that the slits intersect with the second path of the at least two applicators so as to allow the applicators to pass through the two or more slits and simultaneously receive the label from the holding side of the outwardly protruding structure. A simple solution is thus provided for receiving the label by means of "showling" the at least two applicators downwardly and through the outwardly protruding structure.

[0023] The outwardly protruding structure, which may have a nose-like shape, preferably having one end facing

a returning end of the label feeder and the opposite end, or the tip of the nose, pointing distally away from the label feeder. The returning end of the label feeder may be defined as the end where a backing paper of the label feeder, i.e. after the label is received from the label feeder, is returned and is e.g. threaded onto a rewind. This returning end may be relative sharp so upon returning the label is at least partly be exposed with the non-adhesive side facing the holding side of the outwardly protruding structure that removes the label from the label feeder vie e.g. saution.

[0024] In one embodiment, the means for providing the holding force comprises a suction source operably connected to an inner side of the outwardly protruding structure for providing a suction force at the holding side, where the holding side may comprise plurality of openings for transferring the sauction force to the holding side. This suction force is preferably adapted to the size and/or the shape of the label such that it is sufficiently large to remporarily maintain the labels at the planar structure with the adhesive side facing the conveyor means.

[0025] In one embodiment, the at least two applicators interact essentially simultaneously with the label when receiving the label and have indpendent labelling positions depending on the contour of the item to be labeled. It is thus ensured that upon receiving the label it is securly received and carried by the carrying mechanisms of the applicators so the risk that the received label does not fall off the applicators before being put onto the item is eliminated.

[0026] In one embodiment, the labelig apparatus further comprises a printing station adapted to print information on the labels. The the print information may in one embodiment comprise variable information, e.g. weight or price related information, registered by a device and where an indexed relationship is provided between the indiviudual items and the individual item related information such that the labelling on an individual item contains the item related information. This may as an example be where the weight of a tray with a food item is measured while the tray is conveyed towards a packaging and/or labelling station where the the label with exact weight is placed onto the tray. The variable information information may also be selected from, but is not limited to, the price of the items, a quality indicator indicating the quality of the items, information relating to the origination of the items etc..

[0027] In a second aspect of the invention a method is provided for labelling items using a labelling apparatus which comprises:

- a label feeder adapted for feeding self adhesivelabels along a first path, and
- at least two applicators each of which comprising a label carrying mechanism at its distal end, the at least two applicators being adapted to receive a label supplied by the label feeder and move the received label along a second path towards a labelling position where labelling an item takes place, where the at least two applicators are arranged essentially perpendicular to the first path such that when receiving the label the at least two applicators are arranged along the label when moving the received label towards the labelling position.

[0028] In one embodiment, the second path is a cyclic movement path and where upon receiving the label the moving direction of the at least two labels is substantially perpendicular to the first path.

[0029] In general the various aspects of the invention may be combined and coupled in any way possible within the scope of the invention. These and other aspects, features and/or advantages of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] Embodiments of the invention will be described, by way of example only, with reference to the drawings, in which

figure 1 depicts a perspective view and a front view of an item resting in a tray that has been labelled by a prior art labelling apparatus,
figure 2a,b depicts a labelling apparatus according to the present invention for labelling items while the items are conveyed by a conveyor means,
figure 3a,b shows the labelling apparatus in figure 2a,b further comprising a printing station 301 adapted to print information on the labels,
figure 4a,b depicts one embodiment of movement path of the at least two applicators,
figure 5 shows where the backing paper (not shown in figure 2 and 3), i.e. after the labels have been removed from the label feeder, moves in an opposite direction,
figure 6a,b shows a persptive view and a front view on one example of where the number and the position of applicators is adapetd to the shape of the item to be labelled,
figures 7a,b and 8a,b depict graphically one embodiment of a perspective view and a front view of one embodiment of an applicator to be used in relation to the present invention for labeling items while being conveyed in a conveying direction, and
figures 9 and 10 depict graphically in more details the functioning of the force states shown in figure 7a,b and 8a,b.

DESCRIPTION OF EMBODIMENTS

[0031] Figure 2a,b depicts a labelling apparatus 200 according to the present invention for labelling items 211 while the items are conveyed by a conveyor means 212, which may be a conveyor comprising an endless con-

veyor belts, moving in a direction as indicated by the arrow 215.

[0032] The labelling apparatus comprises a label feeder 201 adapted for feeding self-adhesive labels along a first path as indicated by arrow 208, and at least two applicators 202, 203 each of which comprising linearly displaceable pistons 220, 221 including a label carrying mechanism 204, 205 at its distal end, respectively.

[0033] The at least two applicators 209, 210 are adapted to receive a label 206 supplied by the label feeder 201 and move the received label 206 along a second path as indicated by arrows 209, 210, which is substantially perpendicular to the first path 208, towards a labelling position (see figure 2b) where labelling the item 211 takes place. The at least two applicators are arranged essentially perpendicular to the first path 208 such that when receiving the label the at least two applicators are arranged along the label when moving the received label towards the labelling position.

[0034] The labellig apparatus shown in this embodiment further comprises a holding station 220, which as shown here comprises an outwardly protruding structure 207 positioned downstream in relation to a moving direction 208 of the labels from the label feeder 208. The outwardly protruding structure 207 comprises a holding side positioned at substantially same height level or slightly above the height level of the received label facing the conveyor means 212 for receiving and holding the labels prior to be received by the at least two applicators 202, 203. The holding force needed to temporarily hold the received labels before it is received by the at least two applicators may be provided by means of operably connecting an inner side of the outwardly protruding structure 207 to a suction source where the holding side may be provided with plurality of openings, slits and the like, to transfer the sauction force to the received label.

[0035] In the embodiment shown here, the outwardly protruding structure comprises two slits 205, 206 at the distal end of the outwardly protruding structure 207 for receiving the two applicators 202, 203 shown, where the internal arrangment of the slits is such that the slits intersect with the second path 209, 210 of the two applicators such that so as to allow the applicators to pass through the two slits and simultaneously receive the label 206 from the side of the outwardly protruding structure. The number of slits and applicators should of course not be construed to be limited to two, but more than two applicators and slits may be used

[0036] The internal arrangment and/or the number of the at least two applicators is adapted to the shape of the items to be labelled and/or the surface area of the items to be labelled such that it is possible to align the label to the surface of the item. This will be discussed in more details later.

[0037] To ensure that the label is received is a reliable way it is preferred that the at least two applicators 202, 203 interact essentially simultaneously with the label 206 when receiving the label from the holding side. Moreover, the applicators further have indpendent labelling positions depending on the contour of the item to be labeled.

[0038] Figure 3a,b shows the labelling apparatus 300 in figure 2a,b further comprising a printing station 301 adapted to print information on the labels, but this information may be fixed information or variable information such as the weight of the items, the price of the items etc., where this information may be measured (e.g. a scale) and/or calculated such as based on measured weight where the price may be calculated. In order to associated this variable information with each individual item an indexed relationship is provided between the indiviudual items and the individual item related information such that the labelling on an individual item contains the item related information. As an example, the items may be tracked from where the variable information is obtained until the actual labeling takes place to ensure that the variable information are associated to the respective one of the items being associated with the variable information. Thus, if a given item 311 is e.g. weighed by a weighing device (such as dynamic scale) and has a weighing of 253g, this weighing result is sent to a computer (not shown) that operates the printing station 301 such that when the item arrives at the labelling apparatus 300 (see figure 3b) the weight of 253g (and e.g. other variable information such as the price) is printed on a lable 306 that is subsequently received by the applicators as discussed in relation to figure 2a,b and moved to a labeling position (figure 3b) where the labeling takes place.

[0039] Figure 4a,b depicts an example of second path movement of the at least two applicators 202, 203 in figure 3 (and figure 2 in the absence of the printing station shown), which is a cyclic movement as indicated by the arrow 401, where preferably the cyclic movement lies within a plane that lies within the slits 205, 206. The number of applicators/slits should of course not be constured to be limited two applicators, but could just as well be three or more applicators.

[0040] Figure 5 shows where the backing paper 503 (not shown in figure 2 and 3), i.e. after the labels have been removed from the label feeder 201, moves in an opposite direction as indicated by arrow 502 and is threaded onto a rewind 501.

[0041] Figure 6a,b shows a persptive view and a front view on one example of where the number and the position of applicators 601-603 is adapetd to the shape of the item 604. In this example, the item 604 may e.g. be a piece of meat that is resting on a substantially flat plate or tray 605, and where the labeling is fully alligned with the shape of the item 604, where the middle applicator 602 has its labelling position on the top of the item 604 whereas the applicators 603, 601 have their labeling positions on the flate plate adjacent to the item.

[0042] Figures 7a,b and 8a,b depict graphically one embodiment of a perspective view and a front view of one embodiment of an applicator to be used in relation to the present invention for labeling items 711 while being

conveyed in a conveying direction as indicated by the arrow 712.

[0043] The applicator comprises a linearly displaceable piston 701, a labeling carrying mechanism 702, a force-switching-state system 710, a moving mechanism 709 and a frame structure 708.

[0044] The linearly displaceable piston 701 is operable connected to the moving mechanism 706 that moves the piston from a resting position to a labeling position and vice versa. In this embodiment, the moving mechanism comprises an endless belt 706 extending along the piston 701 between two wheels including a driving wheel 707. The coupling between the piston 701 and the endless belt 706 will be discussed in more details later.

[0045] As depicted here, the labeling carrying mechanism 702 is arranged at the distal end of the piston 201 and is adapted to carry an adhesive label (not shown) and for affixing the adhesive label to an item 711 via physical contact with the item at the labeling position of the piston 701. In this embodiment, the labeling carrying mechanism 702 may be a flexible pad may be connected to a media source (not shown) for providing a negative pressure, i.e. suction function, to maintain the label fixed at the flexible pad. The flexible pad 702 may be selected such that it can easily adapt to different surfaces, e.g. incline, declined surfaces or u-shaped surfaces, e.g. is a rubber or plastic material of any type that is flexible.

[0046] For clarification, figures 7 and 8 show the labeling device 700 in different operational positions, where figure 7a and b shows the labeling device 700 in the resting position and figure 8a and b shows the labeling device 700 in the labeling position.

[0047] The force-switching-state system 710 is operable to maintain the piston 201 in relation to the conveyor belt 206 in an attracting force state such that the piston moves with the belt 706 from the resting position shown in figure 7 towards the labeling position shown in figure 8 while maintaining this attracting force at all time. When the flexible pad 702 comes into physical contact with the item 711 an opposite repelling force 801 from the item 711 onto the pad 702 is formed causing a separation of the displaceable piston 701 from the belt 706. This separation causes a change of the force state of the displaceable piston 701 from being in an attracting force state to a repelling force stage causing the linearly displaceable piston to move back to the resting position.

[0048] In the embodiment depicted here this force state is based on an interplay between magnetic forces which will be discussed in more details here below, but it should be noted that the solution of the present invention should not be construed as being limited to magnetic forces, but the interplay between an electrical field and electrical forces might just as well be applied or electro-magnetic forces.

[0049] In this embodiment, the force-switching-state system 710 comprises a drive coupling housing 703, a fixed magnet 704 that is rigidly fixed to a frame structure 708 of the labeling device 700 at a position defining the resting position and a piston magnet 705 that is rigidly fixed to the piston 701. The drive coupling housing 703 circumferentially surrounds the piston 701 in a linear slideable manner and is attached to the belt 706. The drive coupling housing 703 has a cavity facing the fixed magnet 704 with means for generating a localized magnetic field within the cavity of the same pole direction. This may as an example be achieved by arranging one or more small magnets discs 713 having the same magnetic poles under an appropriate angle within the cavity and in that way provide the localized magnetic field. Utilizing the piston magnet 705 which is opposite poled compared to this localized magnetic field, this localized field acts with an attractive magnetic force on the piston magnet 705 when the piston magnet is positioned in the cavity. This state may be defined as the attractive force state.

[0050] This is depicted graphically in figure 9 showing where the piston magnet 705 is positioned within the cavity where the localized magnetic field 901 acts with an attractive force on the piston magnet, and thus acts with an attractive force on the piston since the piston magnet is rigidly mounted to the piston. The scenario shown in figure 9 corresponds to the scenario shown in figure 7. In the resting position the drive coupling housing is positioned adjacent to the fixed magnet with the piston magnet placed there between.

[0051] The fact that the drive coupling housing 203 is attached to the belt (see figure 1) this attractive force state causes, upon moving the drive coupling housing 203 downward towards the labeling position, a simultaneous linear movement of the piston 201.

[0052] Figure 10 depicts in more details the scenario in figure 8 where the labeling pad 702 comes into contact with the item to be labeled causing an opposite repelling force 801 from the item onto the labeling pad. This opposite force causes a displacement of the piston magnet 705 from the localized magnetic field 901. The field of the fixed magnet 704 has the same direction as that of the localized magnetic field 901 and moreover the fixed magnet is selected such that the field strength of the fixed magnet is of a size such that upon release of the piston magnet from the localized magnetic field the fixed magnet exerts with a magnetic force 1001 being larger than the force exerted by the localized magnetic field causing the piston magnet and thus the piston to accelerate towards the fixed magnet. This scenario is shown in figure 8a and b. This movement of the piston back to the resting position cause the piston to accelerate back to the resting position leaving the drive coupling housing 703 to start with behind, which however is operated by a control unit (not shown) that automatically moves the drive coupling housing almost immediately back to the resting position where the attracting force state is established and the labeling device 700 is prepared for the subsequent labeling.

[0053] A sensor may further be provided to sense when the labeling device has reached the resting position, where the sensing signal may be sent to the control unit.

[0054] While the invention has been illustrated and described in detail in the drawings and foregoing description, such illustration and description are to be considered illustrative or exemplary and not restrictive; the invention is not limited to the disclosed embodiments. Other variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

Claims

1. A labelling apparatus (200) for labelling items (211) while the items are conveyed by a conveyor means (212), comprising:

   • a label feeder (201) adapted for feeding self adhesive labels (206) along a first path (208), and
   • at least two applicators (202, 203) each of which comprising a label carrying mechanism (204, 205) at its distal end, the at least two applicators being adapted to receive a label supplied by the label feeder and move the received label along a second path (209, 210) towards a labelling position where labelling an item takes place, where the at least two applicators are arranged essentially perpendicular to the first path such that when receiving the label the at least two applicators are arranged along the label when moving the received label towards the labelling position.

2. The labelling apparatus according to claim 1, wherein the internal arrangment of the at least two applicators (203, 203) is adapted to the shape of the items to be labelled.

3. The labelling apparatus according to claim 1 or 2, wherein the number of the at least two applicators is adapted to the shape of the items to be labelled and/or the surface area of the items to be labelled.

4. The labelling apparatus according to any of the preceding claims, where the at least two applicators are arranged along the label in two or more rows arranged along the label such that the two or more rows form a matrix like arrangement of applicators.

5. The labelling apparatus according to any of the preceding claims, wherein each of the at least two applicators comprises:

   • a linearly displaceable (220, 221, 701) piston having the label carrying mechanism attached to its distal end, the piston being operable connected to a moving mechanism for moving the piston from a resting position to the labelling position,
   • a force-switching-state system (710) operable to maintain the piston in relation to the moving mechanism in an attracting force state such that the piston moves with the moving mechanism to the labelling position, where at the labelling position the label carrying mechanism exerts with a physical contact with the item, where the physical contact with the item creates an opposite repelling force from the item onto the labelling carrying mechanism causing a separation between the displaceable piston from the moving mechanism, where the separation causes a change of the force state of the piston from being in an attracting force state to a repelling force stage causing the piston to move back to the resting position.

6. The labelling apparatus according to claim 5, where the force-switching-state system comprises:

   • a piston magnet rigidly fixed to the piston,
   • a fixed magnet (704) positioned distally away from the labelling carrying mechanism at a position defining the resting position,
   • a drive coupling housing (703) circumferentially surrounding the piston in a linear slidable manner attached to the moving mechansim, the drive coupling housing having an cavity facing the fixed magnet, the drive coupling housing comprising means for generating a localized magnetic field within the cavity so as to provide an attractive magnetic force on the piston magnet when the piston magnet is positioned in the cavity defining the attractive force state,
   wherein the displacement of the piston from the resting position, where the drive coupling housing is positioned adjacent to the fixed magnet with the piston magnet placed there between, towards the labelling position is based on movement of the moving mechanism and thus linear movement of the drive coupling housing, the attractive magnetic force on the piston magnet causing a simultaneous linear movement of the piston from the resting position to the labelling position.

7. The labellig apparatus according to any of the preceding claims, further comprising a holding station (220) adapted to receive and hold the label prior to be received by the at least two applicators.

8. The labelling apparatus according to claim 7, wherein the holding station comprises an outwardly protruding structure (207) positioned downstream in relation to a moving direction (208) of the label feeder, where the outwardly protruding structure comprises a holding side facing the conveyor means, where the outwardly protruding structure is positioned at a height level in relation the received label such that the holding side is positioned at substantially same height level or slightly above the height level of the received label, and where the outwardly protruding structure is operable connected to a means for providing a holding force between the label and the holding side so as to temporarily holding the label.

9. The labelling apparatus according to claim 8, wherein the outwardly protruding structure comprises two or more slits (205, 206) at the distal end of the outwardly protruding structure, the internal arrangment of the slits being such that the slits intersect with the second path of the at least two applicators so as to allow the applicators to pass through the two or more slits and simultaneously receive the label from the side of the outwardly protruding structure.

10. The labelig apparatus according to any of the preceding claims, wherein the at least two applicators interact essentially simultaneously with the label when receiving the label and further have indpendent labelling positions depending on the contour of the item to be labeled.

11. The labelig apparatus according to any of the preceding claims, further comprising a printing station adapted to print information on the labels.

12. The labelig apparatus according to claim 11, wherein the print information comprise variable information, registered by a device and where an indexed relationship is provided between the indiviudual items and the individual item related information such that the labelling on an individual item contains the item related information.

13. A method for labelling items using a labelling apparatus which comprises:

    • a label feeder adapted for feeding self adhesivelabels along a first path, and
    • at least two applicators each of which comprising a label carrying mechanism at its distal end, the at least two applicators being adapted to receive a label supplied by the label feeder and move the received label along a second path towards a labelling position where labelling an item takes place, where the at least two applicators are arranged essentially perpendicular to the first path such that when receiving the label the at least two applicators are arranged along the label when moving the received label towards the labelling position.

14. The method according to claim 14, wherein the second path is a cyclic movement path and where upon receiving the label the moving direction of the at least two labels is substantially perpendicular to the first path.

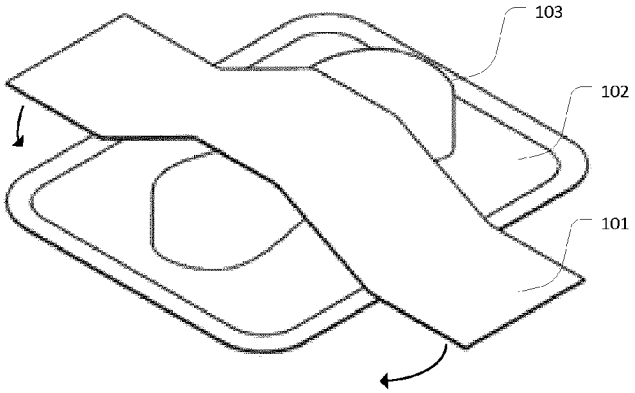

FIG. 1a (prior art)

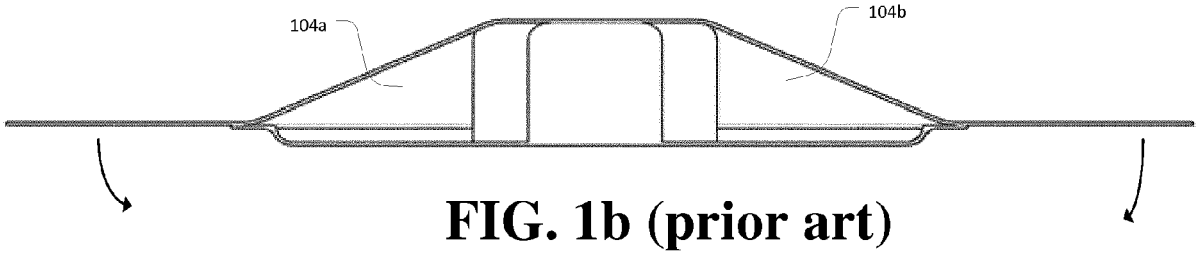

FIG. 1b (prior art)

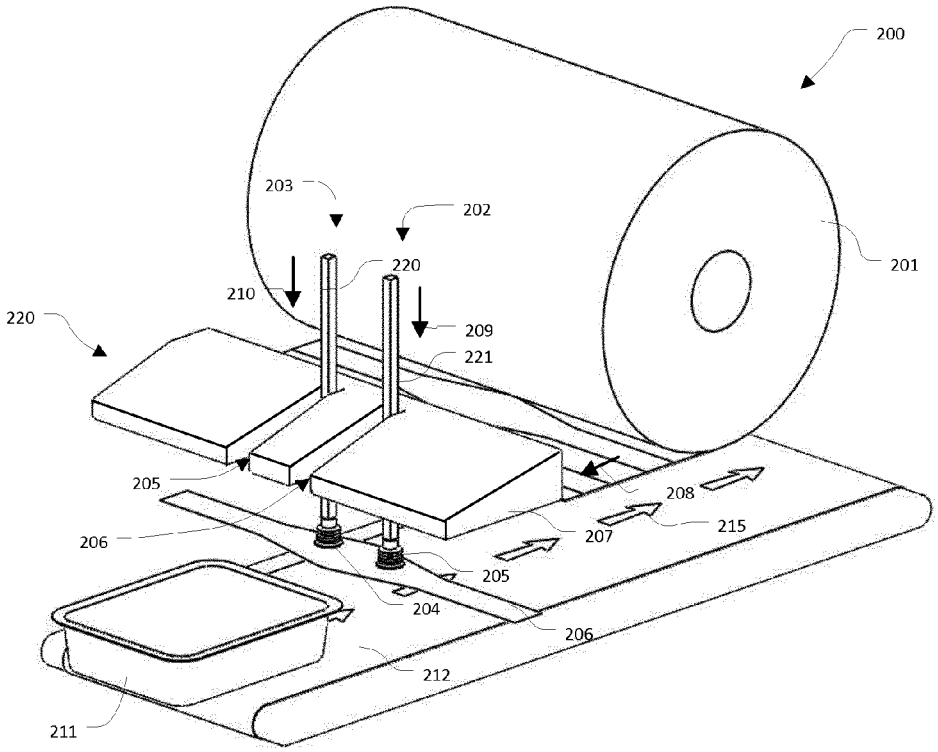
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FIG. 2a

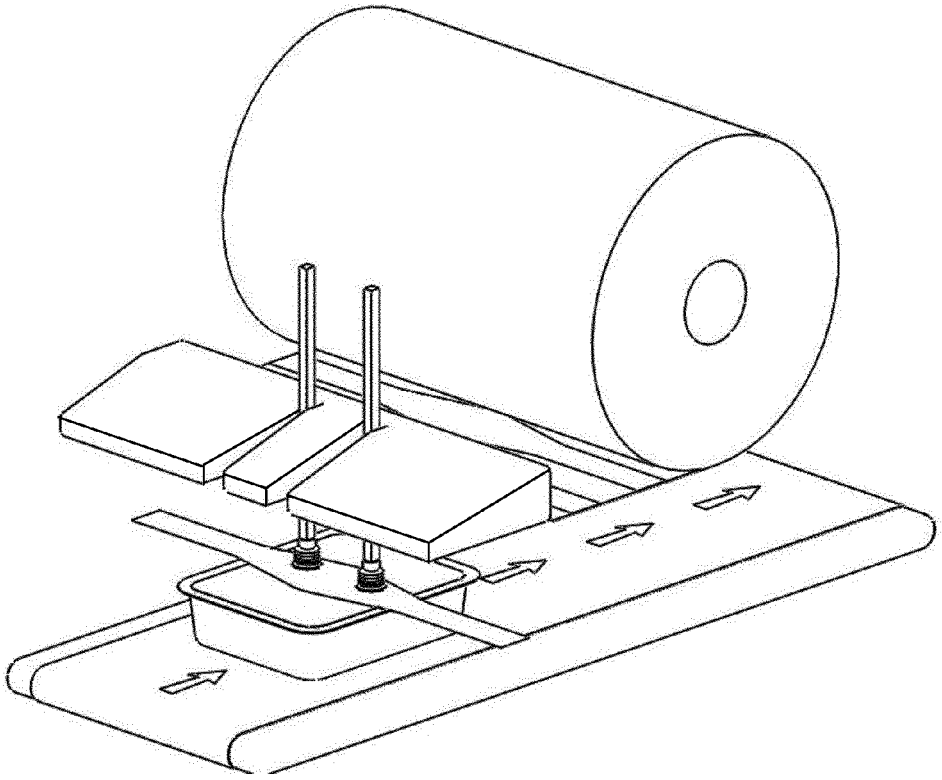

FIG. 2b

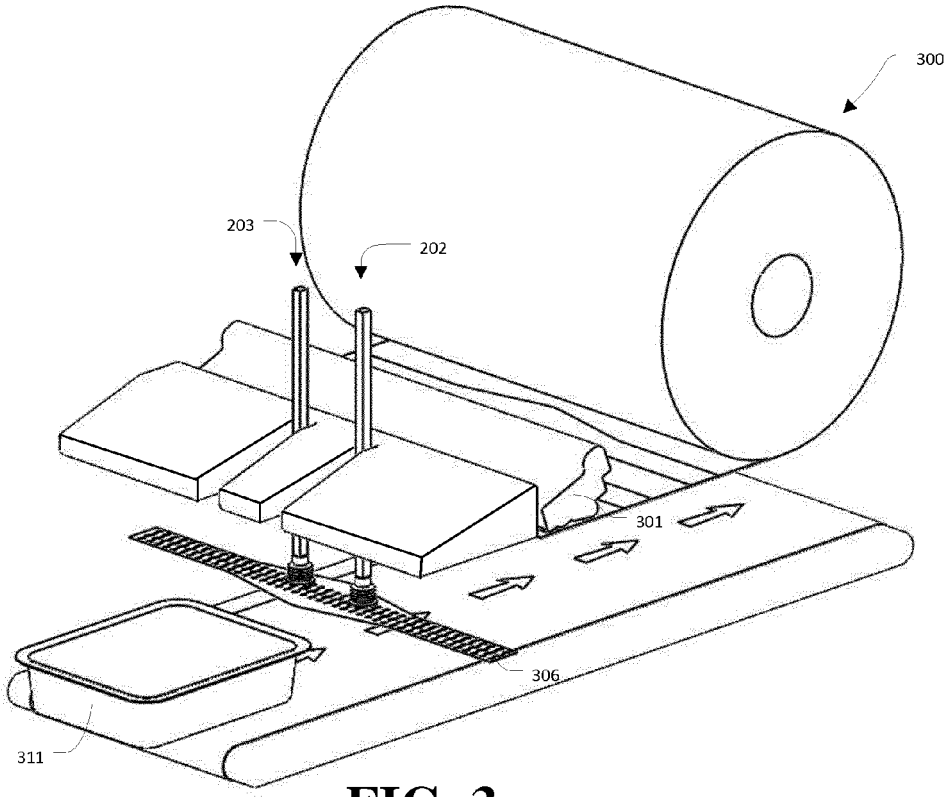

FIG. 3a

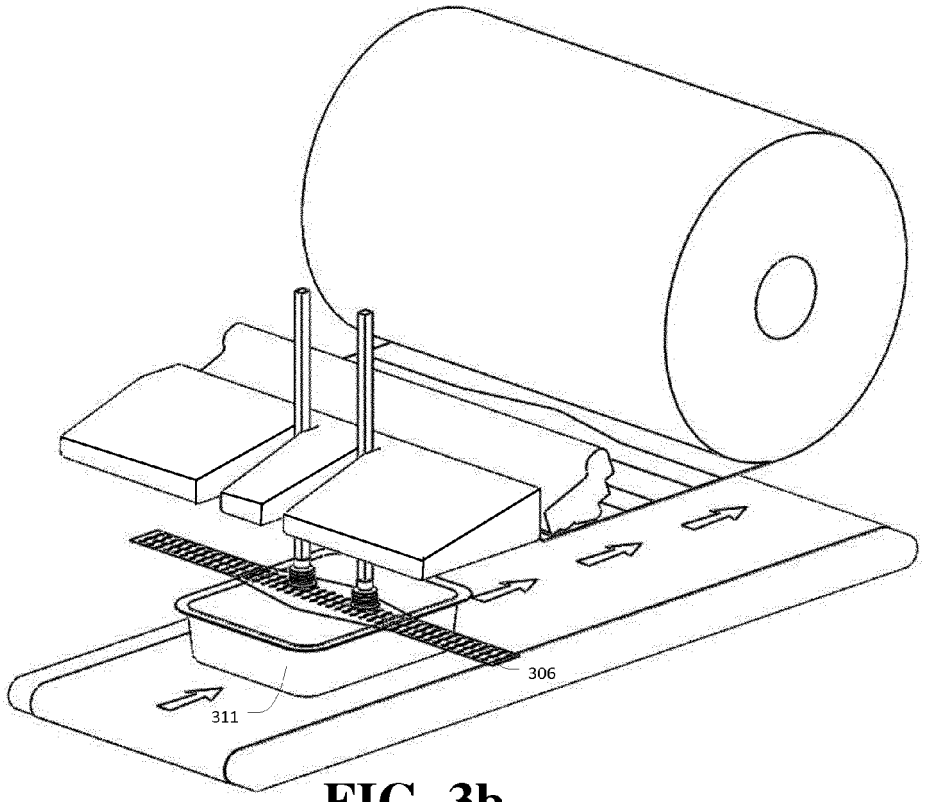

FIG. 3b

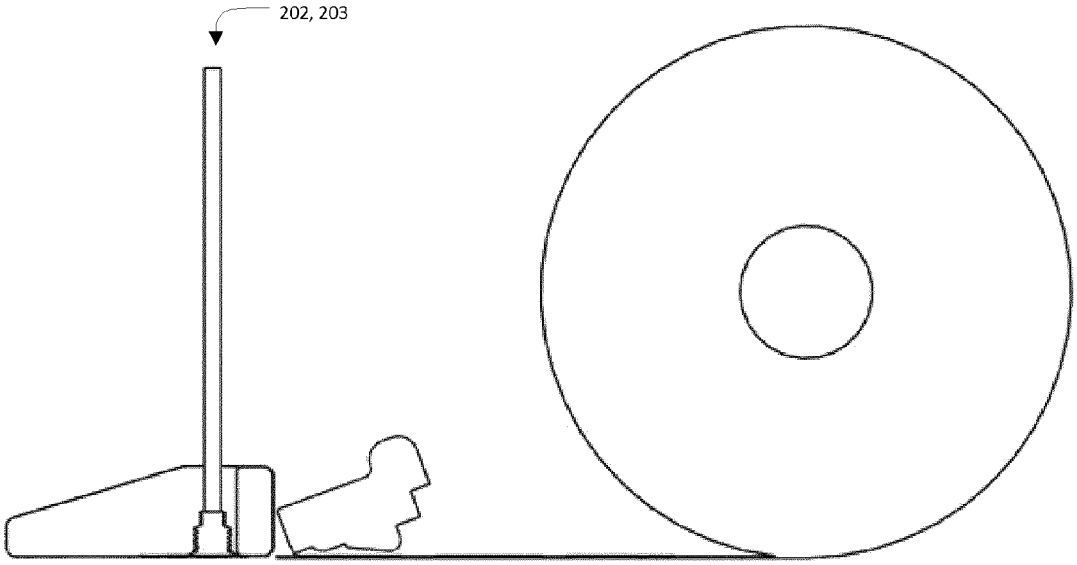

FIG. 4a

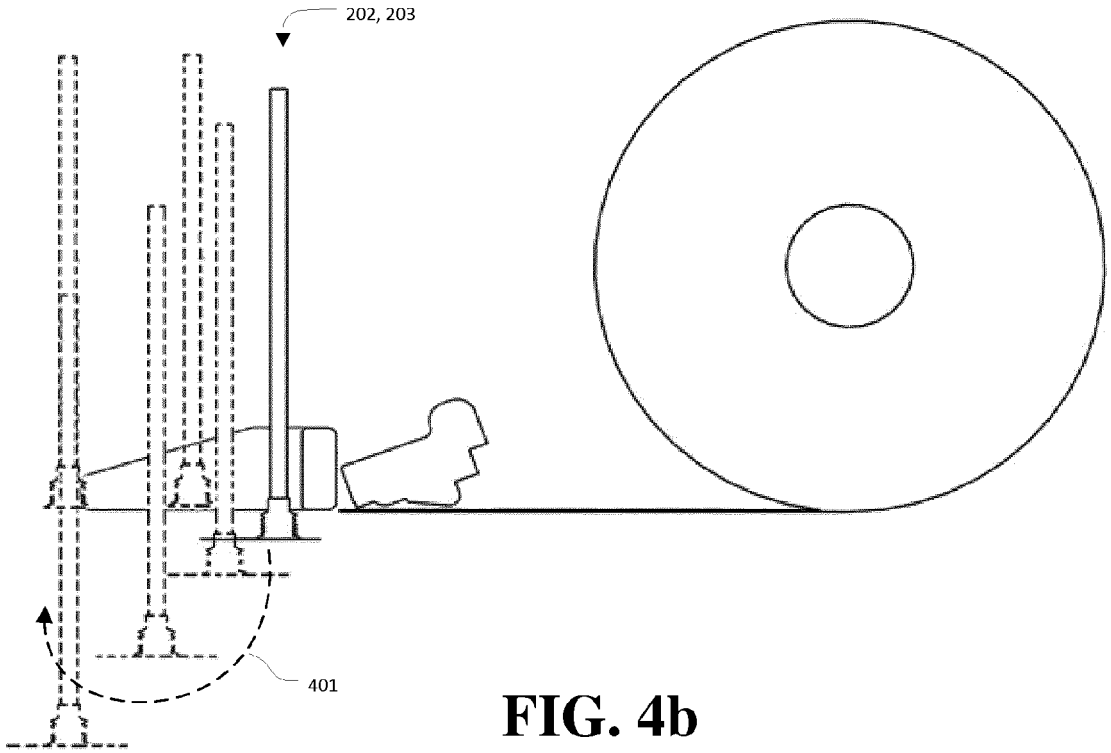

FIG. 4b

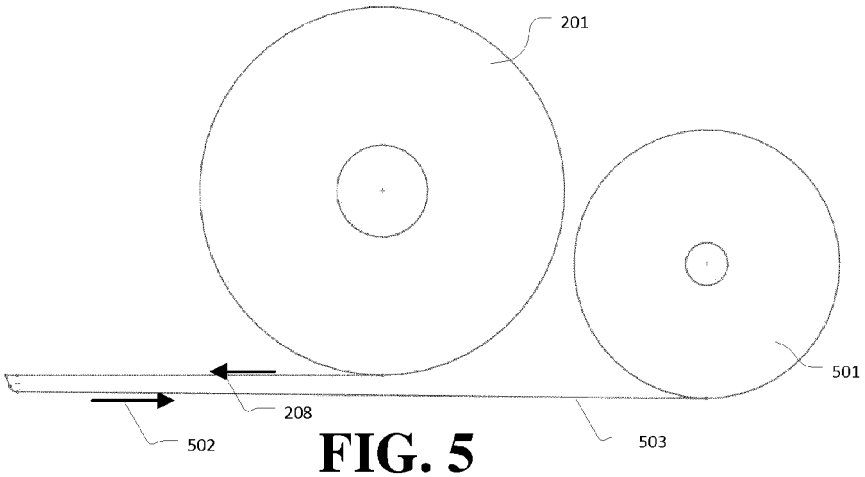

FIG. 5

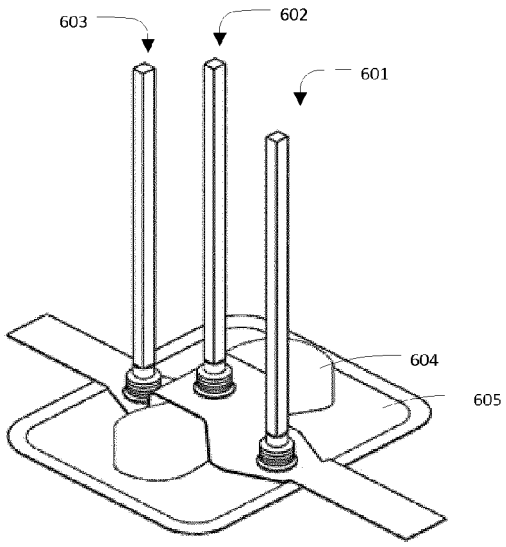

FIG. 6a

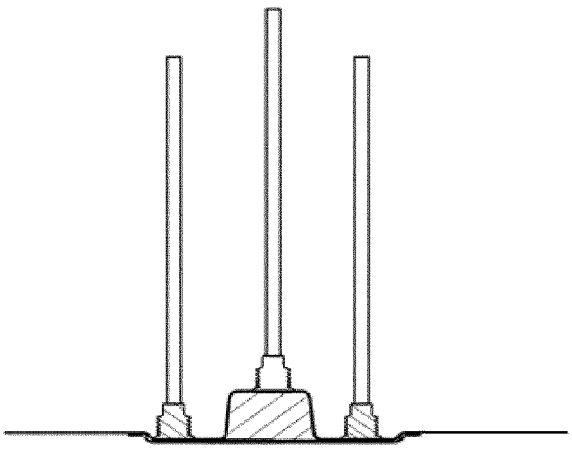

FIG. 6b

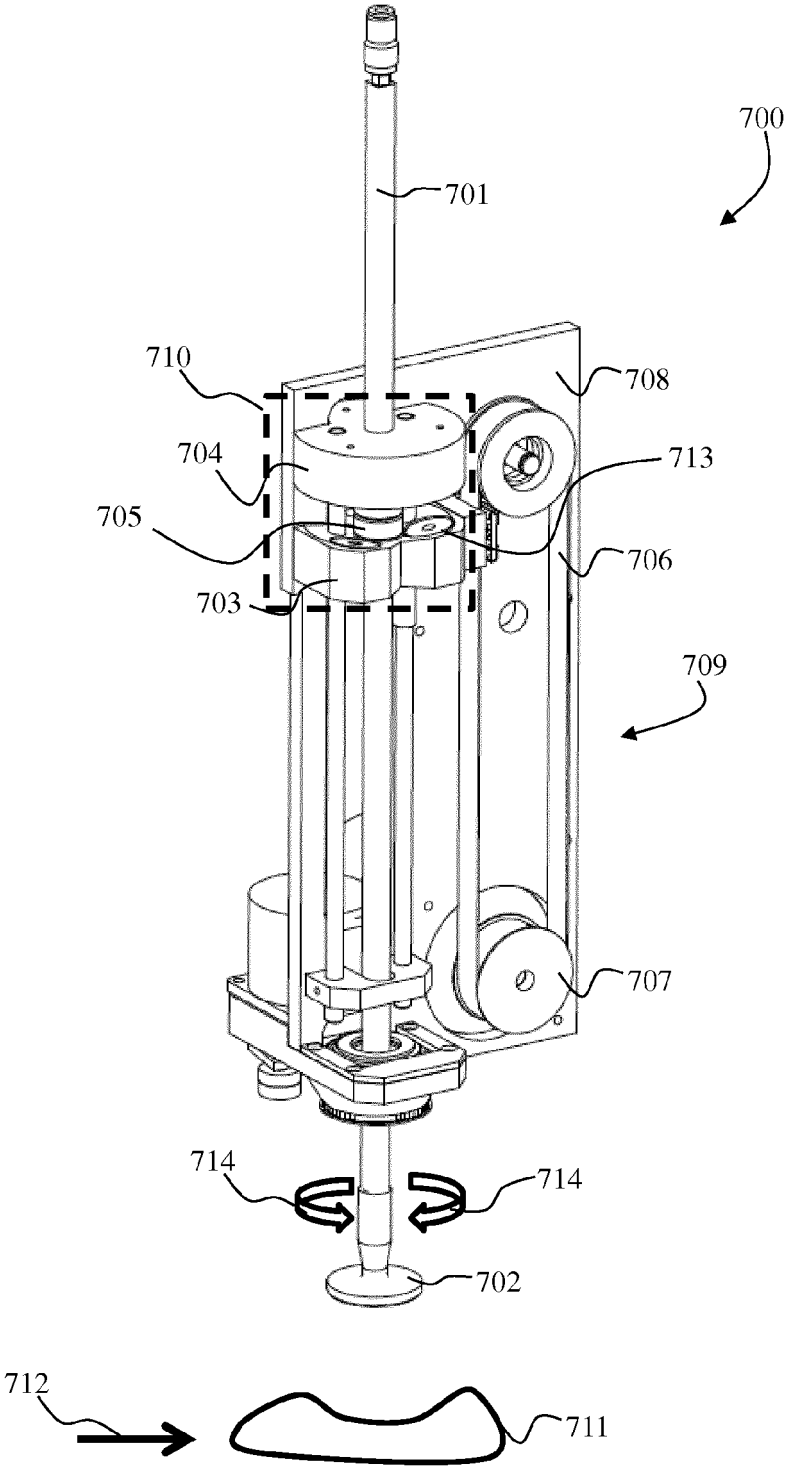

FIG. 7a

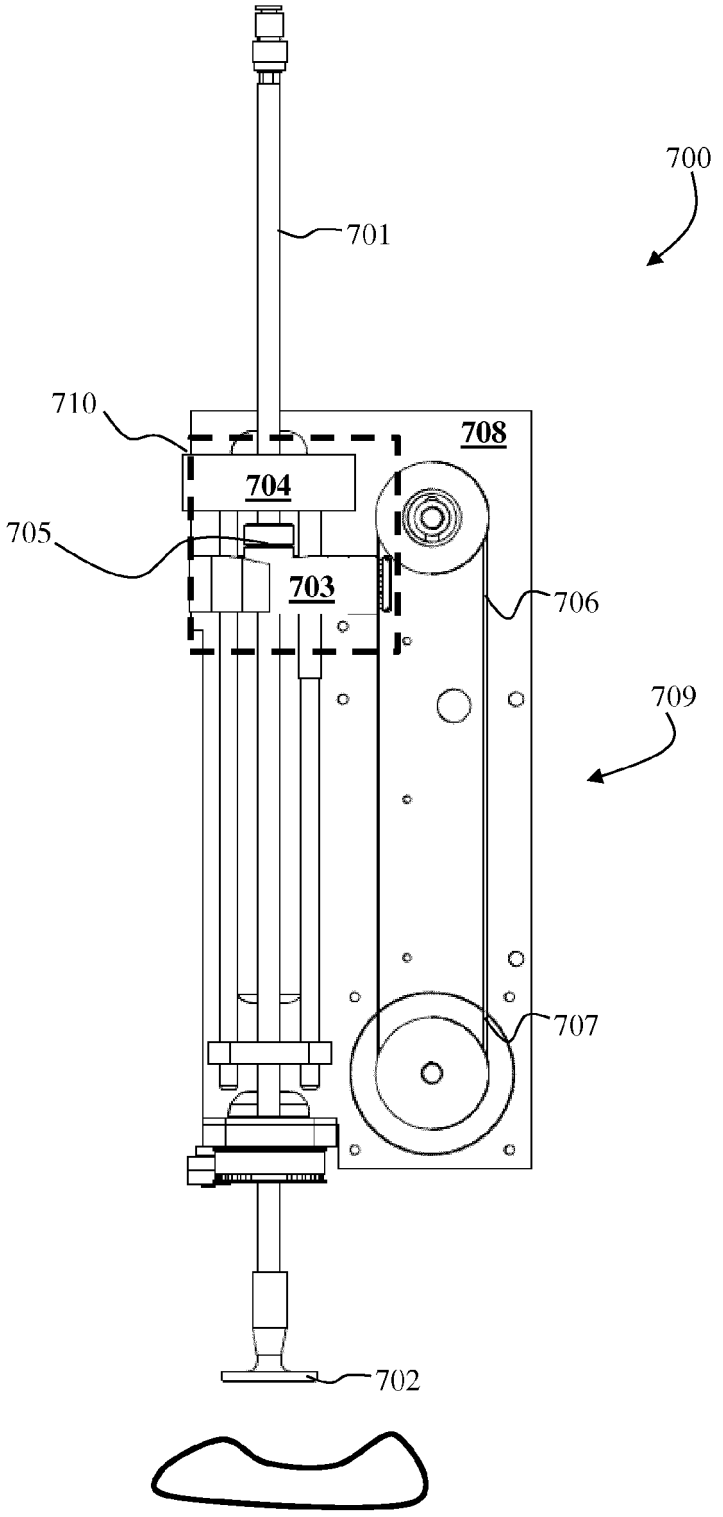

FIG. 7b

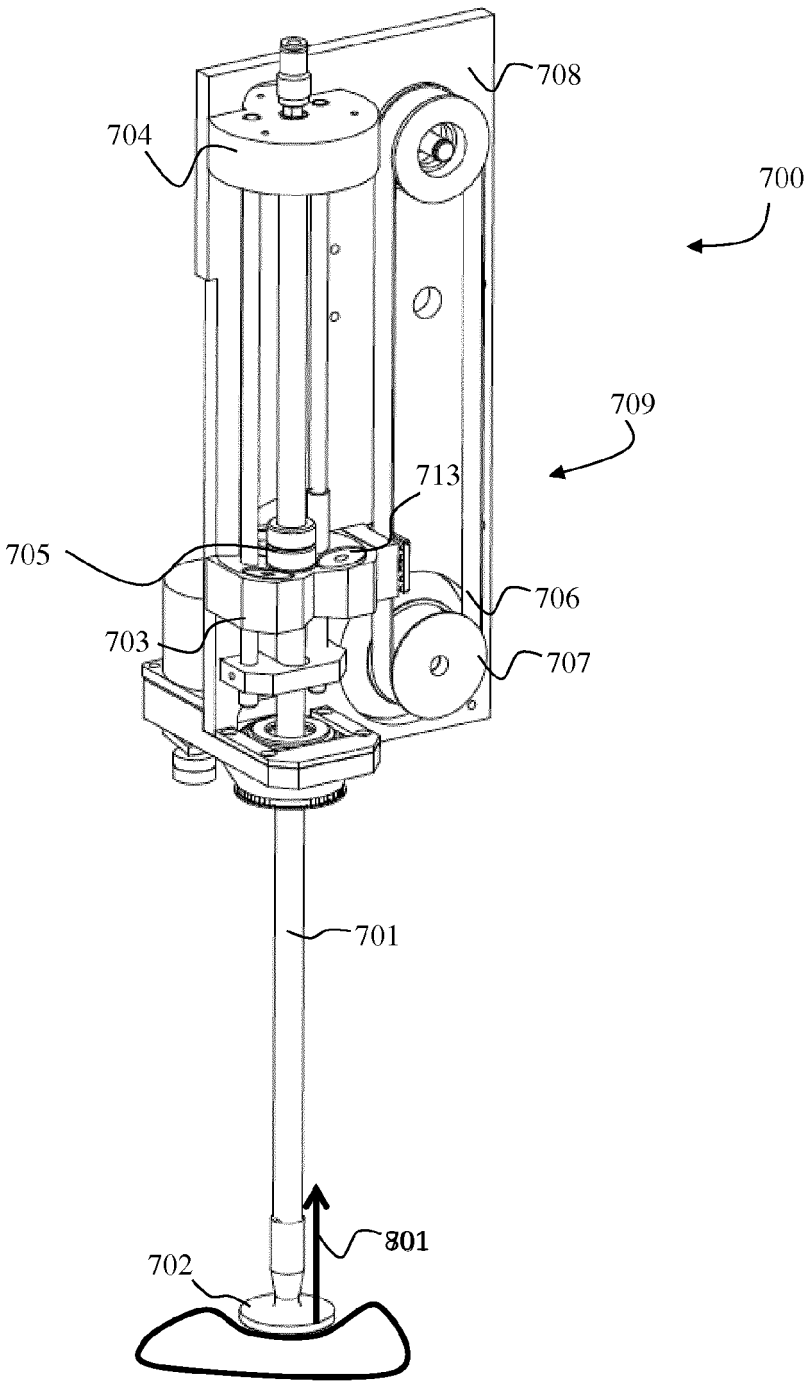

FIG. 8a

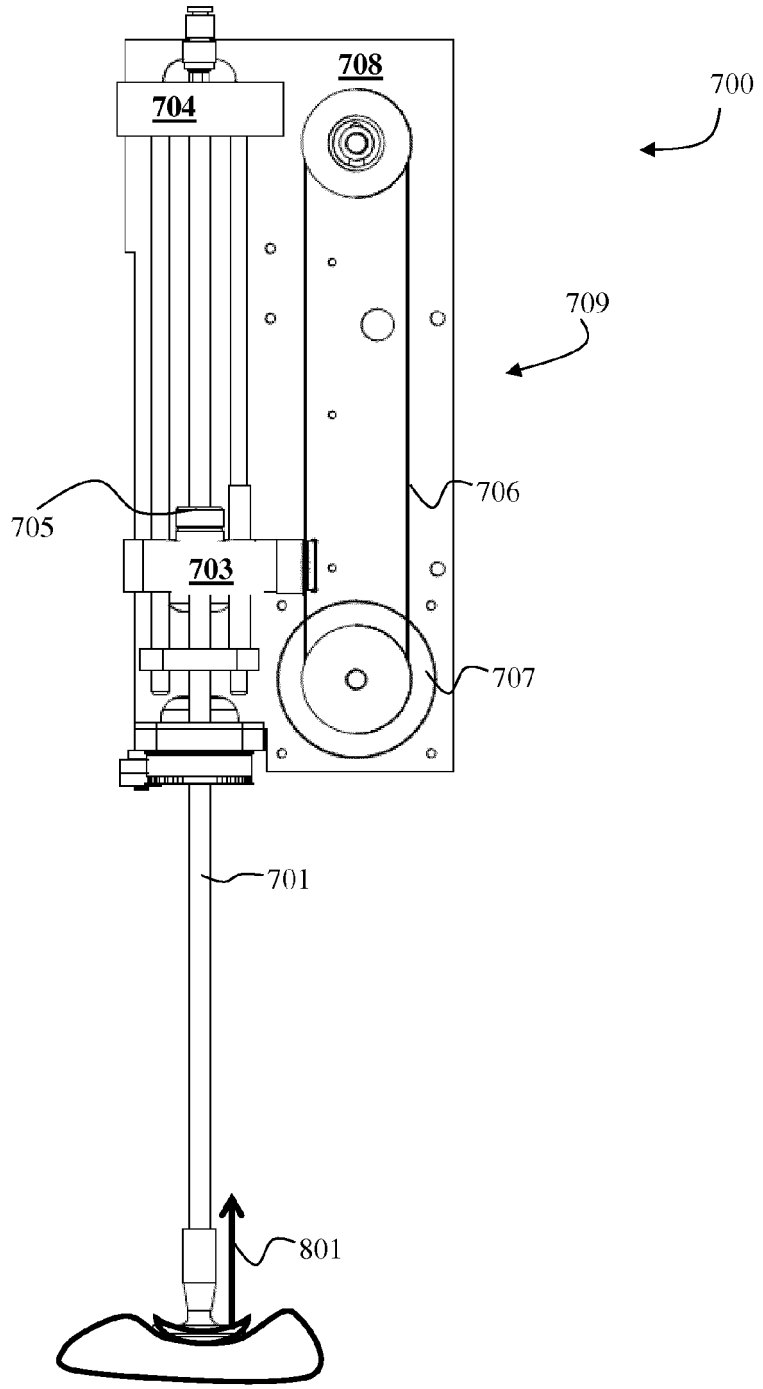

FIG. 8b

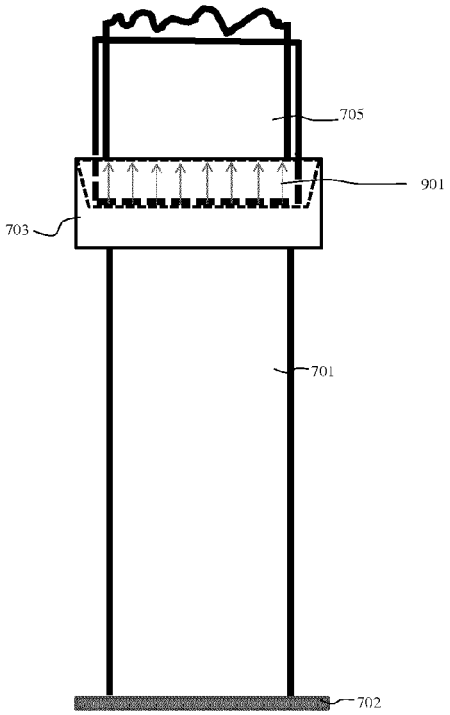

FIG. 9

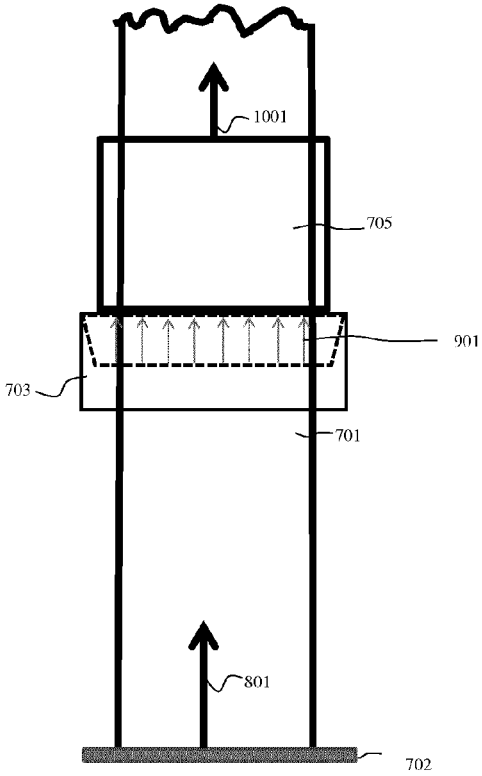

FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 8580

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 5 300 181 A (YAMAGUCHI YASUHIRO [JP]) 5 April 1994 (1994-04-05) * figures 1-10 * * column 3, line 29 - column 12, line 2 *	1-4,7-14 5,6	INV. B65C1/04 B65C9/36
Y	EP 2 695 819 A1 (MAREL SEATTLE INC [GB]) 12 February 2014 (2014-02-12) * claims 1-3 * * figures 1-6 *	5,6	
X	JP 2010 195403 A (ISHIDA SEISAKUSHO) 9 September 2010 (2010-09-09) * figures 1-7 * * abstract *	1-4,7-14	

TECHNICAL FIELDS SEARCHED (IPC)

B65C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 August 2015	Pardo Torre, Ignacio

CATEGORY OF CITED DOCUMENTS

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24-08-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5300181 A	05-04-1994	NONE	
EP 2695819 A1	12-02-2014	DK 2695819 T3	27-10-2014
		EP 2695818 A1	12-02-2014
		EP 2695819 A1	12-02-2014
		US 2014041806 A1	13-02-2014
JP 2010195403 A	09-09-2010	JP 5291490 B2	18-09-2013
		JP 2010195403 A	09-09-2010

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- EP 1118542 A **[0003]**