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(54) DEVICE AND METHOD FOR APPLYING SELF-ADHESIVE LABELS ON THE WALLS OF CONTAINERS

VORRICHTUNG UND VERFAHREN ZUM ANBRINGEN VON SELBSTKLEBENDEN ETIKETTEN AUF BEHÄLTERWÄNDE

DISPOSITIF D'APPLICATION D'ÉTIQUETTES AUTOADHÉSIVES SUR LES PAROIS DE CONTENANTS ET PROCÉDÉ D'APPLICATION D'ÉTIQUETTES AUTOADHÉSIVES

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Description

Technical Field

[0001] This invention relates to a device for applying self-adhesive labels on the walls of containers in accordance with the preamble of claim 1, and a method for applying self-adhesive labels in accordance with the preamble of claim 10, and known from WO 2004/045955.

[0002] Although this invention may allow the application of labels having any shape on flat and conical surfaces, hereinafter reference is made to the application of labels on bottle necks.

[0003] In particular, this invention relates to the field of application of collar labels ("V"-shaped) designed to be applied to the base of the neck of wine bottles, in particular bottles for sparkling wine.

Background Art

[0004] The bottles on which the labels are to be applied are usually positioned on a machine with a rotary carrousel at the outer edge of the carrousel. Around the carrousel there are one or more operating stations which perform the required operations, one of these stations being designed to apply labels, on each bottle.

[0005] At present, according to the prior art, the station for applying collar labels on bottle necks mainly uses two techniques.

[0006] The first technique comprises applying labels by gluing. Said system comprises the use of a mechanical structure which picks up the labels, applies glue on them and then presses the labels on the neck of a bottle.

[0007] However, this first prior art technology has several disadvantages. First, labels which are applied using glue are not always attractive. Second, the equipment is complex and above all expensive.

[0008] For these and other reasons, structures based on a second technique for the application of self-adhesive labels are mainly used. An example of that technique is described in Italian patent ITVR940055.

[0009] This technique is implemented using a structure comprising a pusher element able to move in a direction perpendicular to a wall of the bottle on the carrousel which is passing the pusher element. A web supporting the labels simultaneously arrives at the pusher element. When a bottle arrives, the labels are detached from the web and the pusher element pushes the label against the bottle neck, thus sticking at least the central part of the label onto the bottle. The pusher element usually comprises a roller, able to rotate idly about its own axis of rotation, made of soft material which acts perpendicularly against the wall of the bottle, pressing the label against it and promoting label sticking on the bottle.

[0010] In accordance with this prior art technique, the roller presses the label at a central part of the label. In that way, label first sticking on the bottle is performed, but following the action of the roller the ends of the label remain detached from the bottle. Then, as the bottles are fed on the carrousel, each end of the label is stuck down (second sticking).

[0011] To do this, after the action of the pusher element, each bottle is usually rotated clockwise through half a revolution (so that one end of the label projects radially from the carrousel) and made to pass close to a first fixed contact surface which is in a position at a tangent to the bottle. The first fixed contact surface makes the projecting end of the label adhere to the bottle thanks to the movement of the bottle. Then the bottle is rotated anti-clockwise and is passed close to a second contact surface to make the other end of the label adhere to the bottle. Each end of the label adheres thanks to the movement of the bottle close to the contact surfaces.

[0012] However, this second prior art technology has several disadvantages.

[0013] First, the first sticking is often not performed perfectly because the label stuck sometimes has wrinkles typical of sticking that was not completely successful. This is due to the fact that the tangential speed of the bottle at the pusher element is different to the speed of the pusher element which is null. The pusher element pushes in a direction transversal to the wall of the bottle and compensates for the speed difference only thanks to rotation of the roller about its own axis of rotation.

[0014] Moreover, the mechanical structure is bulky and increases the overall dimensions of the machine with rotary carrousel.

Disclosure of the Invention

[0015] In this situation the technical purpose which forms the basis of this invention is to provide a device for applying self-adhesive labels which overcomes the above-mentioned disadvantages.

[0016] In particular, the technical purpose of this invention is to provide a device for applying self-adhesive labels which guarantees perfect sticking, avoiding wrinkles in the label.

[0017] The technical purpose of this invention is also to provide a device for applying self adhesive labels which has smaller overall dimensions than the prior art devices.

[0018] The technical purpose specified and the aims indicated are substantially achieved by a device for applying self-adhesive labels and a method for applying self-adhesive labels as described in the appended claims.

Brief Description of the Drawings

[0019] Further features and the advantages of this invention are more apparent in the detailed description of a preferred, non-limiting embodiment of a device for applying self-adhesive labels illustrated in the accompanying drawings, in which:

Figure 1 is an axonometric view of a device for ap-

plying self-adhesive labels in accordance with this invention;

Figure 2 is a top view of the device for applying self-adhesive labels of Figure 1 operatively associated with a container;

Figure 3 is a side view of the device for applying self-adhesive labels of Figure 1 operatively associated with a container; and

Figure 4 is a top view of a detail of the device for applying self-adhesive labels from Figure 2.

Detailed Description of the Preferred Embodiments of the Invention

[0020] With reference to the accompanying drawings the numeral 1 denotes in its entirety a device for applying self-adhesive labels made in accordance with this invention.

[0021] The device 1 for applying self-adhesive labels described hereinafter is designed to apply labels on the walls of containers of any type. It is preferably used in the sector of bottles 2, therefore hereinafter reference is made to bottles 2 by way of example, but without excluding the possibility that the device 1 may be used for any other type of container.

[0022] The device 1 is operatively connectable to an operating machine of the type with a rotary carrousel 100 on which, in practice, the bottles 2 to which the labels 101 must be applied are positioned.

[0023] Operating machines with a rotary carrousel 100 are well known in the sector of processing bottles 2 and therefore are not described in detail below. Operating machines with a rotary carrousel 100 usually comprise a carrousel 100 able to rotate about a rotation shaft. The bottles 2 are positioned on the outer edge of the carrousel 100. Each bottle 2 is usually in a predetermined position on a circular plate 102 whose centre lies on a circular line A centred on the axis of rotation of the carrousel 100. The movement of the carrousel 100 is transmitted by a main motor connected to the rotation shaft.

[0024] The device 1 according to this invention comprises a supporting body 3 extending from a first end 4 connected to a basic mechanical unit to a second end 5 which is close to the rotary carrousel 100. Figure 1 shows how the supporting body 3 is a mechanical structure extending from the basic mechanical unit (of the known type and therefore not described herein) towards the carrousel 100.

[0025] The supporting body 3 preferably comprises a central plate 6, a first lateral arm 7 and a second lateral arm 8. The two lateral arms 7, 8 extend from the first end 4 to the second end 5, forming the sides of the supporting body 3. The central part of the supporting body 3 is formed by the central plate 6. In the preferred embodiment the central plate 6 extends from the first end 4 towards the second end 5 as far as an intermediate zone 9 and not as far as the second end 5 like the lateral arms 7, 8.

[0026] The device 1 also comprises at least one operating head 10 connected to the supporting body 3 at the second end 5.

[0027] Figure 1 shows how the operating head 10 comprises a basic frame 11 connected to the supporting body 3. The basic frame 11 is connected to the first arm and the second arm 8 at the second end 5. The basic frame 11 is also connected to the central plate 6 by means of a supporting rod 12. This supporting rod 12 has a first connecting part which is connected (by screws) to the central plate 6 at the intermediate zone 9, and a second connecting part which is connected to the basic frame 11.

[0028] Figure 1 shows how the main direction of extension of the basic frame 11 is preferably substantially transversal to the main direction of extension of the supporting body 3. Moreover, the basic frame 11 extends from a first portion 13 (connected to the first arm 7), to a second portion 14 (connected to the second arm 8). The second portion 14 of the basic frame 11 also comprises a projecting portion 15 which projects cantilever-style relative to the second arm 8 in the direction of extension of the basic frame 11.

[0029] The operating head 10 also comprises an application portion 16 which, in practice, is the part which directly interacts with the walls of a bottle 2 on which the labels 101 must be attached. In the preferred embodiment in Figure 1 the application portion 16 is mounted on the projecting portion 15 and makes direct contact with the walls of a bottle 2 on which the label 101 must be applied.

[0030] According to this invention, the application portion 16 of the operating head 10 can move at least along an arc B of a circle C which at a tangent point T is at a tangent at least to a wall of a bottle 2 positioned on the carrousel 100 and at the operating head 10.

[0031] The application portion 16 can move at least along an arc B of a circle C and label 101 application takes place at the point where the arc B and the wall of the bottle 2 are at a tangent to each other.

[0032] In that way, a label 101 is applied on a bottle 2 tangentially to the direction of feed of the bottle 2 on the carrousel 100. Indeed, in operating conditions the peripheral speed of the application portion 16 at least at the tangent point T is controlled so that it is substantially equal to the peripheral speed of the wall of the container on which the label 101 is to be applied.

[0033] In the preferred embodiment illustrated in the accompanying drawings, the application portion 16 performs a complete revolution about a main axis of rotation and therefore follows not only the arc B of a circle C, but the entire circle C which comprises the arc B.

[0034] In the preferred embodiment, rotatably mounted on the projecting potion 15 of the frame there is a rod 17 (also part of the operating head 10) having a first end 18, a second end 19 and a central part 20 located between the two ends 18, 19. The rod 17 can rotate about a main rotation shaft 21 (corresponding to the main axis) passing through the central part 20 and, in practice, substantially parallel with the wall of a bottle 2.

[0035] In this first embodiment illustrated in Figure 1 one can see how the central part 20 of the rod 17 is connected to the main shaft 21 by means of a first disk 22 connected to the main shaft 21 and a second disk 23. The two disks 22, 23 are connected to each other and the rod 17 is interposed between them. Advantageously, the second disk 23 comprises a cavity in which the central part 20 of the rod 17 is positioned. In that way, by connecting the disks 22, 23 to each other (advantageously using screws) the rod 17 is securely connected to the main shaft 21 and moves integrally with it.

[0036] Figure 1 shows how the application portion 16 is mounted on the rod 17 at the first end 18 of the rod. In that way the application portion 16 can perform a 360° rotation about the main shaft 21. The main rotation shaft 21 intersects the rod 17 at a point P. The distance between the point P and the first end 18 of the rod 17 is the radius of the circle C.

[0037] In a first preferred embodiment the connecting point P between the rod 17 and the main shaft 21 is fixed and does not vary during rod 17 rotation.

[0038] In a second embodiment, not illustrated in the accompanying drawings, the connecting point P between the rod 17 and the main shaft 21 may vary along the extension of the rod 17 from the first end 18 to the second end 19. In an example of this second embodiment the central part 20 of the rod 17 may comprise a slideway in which the main shaft 21 will be slidably inserted. The sliding will be controlled based on operating requirements. In particular, the radius of the circle C will be variable depending on the angular position of the application portion 16.

[0039] The application portion 16 is preferably a first roller 24 able to rotate idly about a secondary shaft 25. The secondary shaft 25 is mounted at the first end 18 of the rod 17 and is substantially parallel with the main shaft 21. The accompanying drawings show how the operating head 10 comprises a connecting element 26 and a bar 27. The bar is mounted on the second end 19 of the rod 17 in such a way that it is substantially parallel with the secondary shaft 25 and has the same length as the secondary shaft 25. The connecting element 26 is mounted between the bar 27 and the secondary shaft 25 in a position opposite the rod 17.

[0040] In that way, in the preferred embodiment the connecting element 26, the sliding bar 27, the rod 17 and the secondary shaft 25 form a quadrangular structure.

[0041] The first roller 24 is preferably made of elastic material to promote label 101 application on the bottle 2. At the moment when the label 101 is applied the first roller 24 is at a tangent to the wall of a bottle 2 along a tangent line parallel with the secondary shaft 25 and passing through the tangent point T. In that way, when the first roller 24 is at a tangent to a wall of the bottle 2 the roller deforms slightly, allowing the label 101 to adhere to the wall at several points adj acent to the tangent line. Moreover, the first roller 24 is idly mounted on the secondary shaft 25 in such a way that, at the moment the label 101 is applied, it compensates for any small speed differences between rotation of the carrousel 100 and rotation of the rod 17.

[0042] The device 1 for applying self-adhesive labels 101 according to this invention comprises label feed means 28 for feeding a web 103 with adhesive labels 101, for feeding the labels 101 to the application portion 16. Advantageously, the web 103 brings at least one label 101 at a time to the operating head 10.

[0043] The feed means 28 comprise a feeding roller 29 for storing the web 103 to be used, and a receiving roller 30 for receiving the web 103 once the labels 101 have been removed from it. The feeding roller 29 and the receiving roller 30 are positioned close to the first end 4 of the supporting body 3.

[0044] The web 103 follows a feed path from the feeding roller 29 to the receiving roller 30 and is guided by guide means 31 which are partly mounted on the operating head 10. The guide means 31 guide the web 103 towards the operating head 10 and in particular to the application portion 16. The guide means 31 preferably at least mainly comprise second rollers 32 idly mounted on the supporting body 3 and on the operating head 10. Each of these second rollers 32 has an axis of rotation substantially parallel with the axis of rotation of the first roller 24.

[0045] The part of the guide means 31 mounted on the operating head 10 comprises an inversion plate 33 connected to the basic frame 11. The inversion plate 33 has an away surface 34, a return surface 35 which is substantially parallel with and opposite the away surface 34, and a detaching edge 36 between the two surfaces 34, 35. The inversion plate 33 has a first part 37 connected to the basic frame 11 and a second part 38 projecting from it and close to the first roller 24. The detaching edge 36 is part of the second part 38 of the inversion plate 33 and allows labels 101 to be released towards the bottle 2.

[0046] In the embodiment illustrated in the accompanying drawings the away surface 34 of the inversion plate 33 is connected to a tab 39 transversal to the away surface 34 and substantially parallel with the basic frame 11. The inversion plate 33 is connected to the basic frame 11 by means of the tab 39.

[0047] The device 1 also comprises means 40 for adjusting the inversion plate 33 for adjusting the position of the inversion plate 33 on the basic frame 11. In the preferred embodiment illustrated in Figure 1 the adjusting means 40 comprise an elongate hole 41 with a curved profile in the tab 39; and at least one screw 42, in practice passing through the elongate hole 41 and screwed into the basic frame 11. The hole 41 extends between a maximum projection end 43 and a minimum projection end 44.

[0048] In that way, the adjusting means 40 allow adjustment of the position of the inversion plate 33 between a maximum projection position in which the screw 42 is fixed in a position close to the maximum projection end 43 (in which the detaching edge 36 projects at its maxi-

mum relative to the basic frame 11), and a minimum projecting position in which the screw 42 is fixed in a position close to the minimum projection end 44. Advantageously, during an adjusting step, the curved profile of the elongate hole 41 allows the detaching edge 36 to be moved towards the application portion 16 during the passage from the maximum projection position to the minimum projection position.

[0049] The web 103 releases the labels 101 as it passes from the away surface 34 to the return surface, at the detaching edge 36. During this passage each label 101 detaches from the web 103 and is directed towards the first roller 24 at the moment when it is close to the tangent point with a wall of a bottle 2.

[0050] The inversion plate 33 and the way in which the labels 101 detach from the web 103 are known in the sector for application of labels 101 to bottles 2, and therefore they are not described in further detail below.

[0051] The device 1 according to this invention also comprises motor-driven means 45 connected to the main shaft 21 for shaft rotation. In the preferred embodiment the motor-driven means 45 are a motor. Figure 1 shows how the motor is connected to the basic frame 11. The motor comprises a rotary rotor operatively connected to the main shaft 21 by transmission means 46.

[0052] In the preferred embodiment illustrated in Figure 1 the transmission means 46 comprise two pulleys and a driving belt. A first pulley is mounted on the motor rotor, whilst a second pulley is mounted on the main shaft 21. Advantageously, the two pulleys have respective axes of rotation which are parallel and lie in the same plane. In this way, the driving belt mounted on the pulleys transmits rotary motion from the first pulley to the second pulley. In a first alternative embodiment, not illustrated in the accompanying drawings, the transmission means 46 may comprise gear wheels.

[0053] In a second alternative embodiment, not illustrated in the accompanying drawings, the transmission means 46 may comprise simply a coupling which directly connects the motor rotor to the main shaft 21 in such a way that the main shaft 21 continues on from the rotor.

[0054] The device 1 according to this invention also comprises a coordinating and synchronising control unit which is operatively connected to the motor-driven means 45, the feed means 28 and the carrousel 100 for synchronising label 101 application operations so that, in operating conditions, the central part of the label 101 is preferably interposed between the application portion 16 and the wall of the bottle. The motor-driven means 45 can be synchronised with the movement of the carrousel 100 in such a way that when a bottle 2 is close to the operating head 10 the condition may arise in which the first roller 24 and a wall of the bottle 2 are at a tangent to each other.

[0055] The coordinating and synchronising control unit controls the peripheral speed of the first roller 24 and the peripheral feed speed of the bottle 2 at the tangent point in such a way that they are substantially the same. In this way, wrinkles in the label 101 applied during the sticking step are avoided.

[0056] The coordinating and synchronising control unit is also operatively connected to the feed means 28 to coordinate label 101 feed towards the application portion 16 at the moment when the bottle 2 is close to the application portion 16.

[0057] The embodiment in Figure 4 shows the device 1 at the moment when the label 101 is applied to the bottle 2. The central part of the label 101 is interposed between the first roller 24 and the bottle 2 when the first roller 24 and the bottle 2 are at a tangent to each other along the tangent line.

[0058] The device 1 according to this invention also comprises detector means for detecting the position of the application portion 16, the feed means 28 and the bottles 2 on the carrousel 100. The detector means are operatively connected to the coordinating and synchronising control unit.

[0059] The detector means preferably comprise a plurality of sensors positioned close to the carrousel 100, the motor-driven means 45 and the feed means 28. In the accompanying drawings the coordinating and synchronising control unit and the detector means are not shown, since they are of the known type.

[0060] The device 1 for applying self-adhesive labels 101 comprises movement means for moving the supporting body 3 towards or away from the container. In the preferred embodiment the bottom of the supporting body 3 is slide-shaped and is in turn slidably mounted on a track. The supporting body 3 is therefore able to move between a back position and a forward portion towards the container.

[0061] The movement means also allow the supporting body 3 to be moved vertically, shifting the operating head 10 at least along the entire height of the bottle 2. In that way, the position of the application portion 16 relative to the bottle 2 can be varied, allowing variation of the point of application of the label 101 on the bottle 2.

[0062] The movement means also allow the supporting body 3 to be rotated about a first axis which is transversal to the direction of extension of the supporting body 3 and/or about a second axis which is transversal to the first axis.

[0063] In that way, it is possible to vary the angle, to the horizontal, of the application portion 16 for adjusting the latter to the angled surfaces of a bottle 2 (for example the neck of the bottle 2).

[0064] The movement means are not illustrated in the accompanying drawings, since they are of the known type and therefore they are not described in further detail herein.

[0065] Operation of the movement means, to adjust the position of the application portion 16 relative to the bottle 2, may be either manual or automatic.

[0066] Manual operation of the movement means requires translation and rotation of the supporting body 3 by acting manually on levers and the like to move the

supporting body 3 to the desired position.

[0067] In contrast, automatic operation requires the movement means to be operatively connected to the coordinating and synchronising control unit to control the movement of the supporting body 3 relative to the carrousel 100 so that it adapts to the type of bottle 2 to be processed. In that case, the movement means will comprise motor-driven means for automatic movement of the supporting body 3.

[0068] Moreover, the control unit can save information about the various types of bottles 2 to be processed. In that way, after a size change-over, it is possible to select the size to be processed and consequently the control unit will automatically issue commands to the movement means so that they position the supporting body 3 correctly.

[0069] Operation of the device 1 for applying labels 101 derives directly from what is described above.

[0070] First, the movement means are used to correctly position the application portion 16 depending on the type of bottle 2 and depending on the wall of the bottle 2 on which the label 101 is to be applied.

[0071] As already indicated, operation of the movement means may be manual or automatic. In the former case an operator will act manually on the movement means, bringing the application portion 16 to the desired position. Therefore, the supporting body 3 must be moved vertically rather than horizontally and suitably angled.

[0072] In the latter case (automatic operation) commands are issued to be movement means automatically by the coordinating and synchronising control unit which, once the parameters relating to the bottle 2, the label 101 and the point where the label 101 is to be applied have been entered, issues commands to the movement means to bring the application portion 16 into position.

[0073] It is also possible to act on the adjusting means 40 to adjust the position of the inversion plate 33 relative to the application portion 16.

[0074] The bottles 2 on which the labels 101 are to be applied are positioned along the outer edge of the carrousel 100 and move forwards thanks to rotation of the carrousel 100 towards the device 1 for applying the labels 101. At the same time the motor-driven means 45 are activated, which make the first roller 24 rotate about the main axis.

[0075] The coordinating and synchronising control unit coordinates the position of the first roller 24 with the position of the bottles 2 on the carrousel 100 in such a way that for each bottle 2 which reaches the operating head 10 the first roller 24 is at a tangent to a wall of the bottle 2. At the same time the coordinating and synchronising control unit synchronises the speed of rotation of the carrousel 100 with the speed of rotation of the first roller 24 about the main axis so that the two speeds are substantially equal at least at the tangent point.

[0076] At this point the feed means 28 for the web 103 supporting the labels 101 are activated. The feed means 28 bring the web 103 to the operating head 10 and in particular the web 103 is made to slide on the two surfaces of the inversion plate 33. The detector means detect the presence of the label 101 close to the application portion 16. The coordinating and synchronising control unit receives the information about the position of the label 101 and initially issues a command to the feed means 28 to remain stationary. Subsequently, after the initial step but before the moment when the first roller 24 and the bottle 2 are at a tangent to each other, the command is issued to the feed means 28 to move the web 103 by one step, thus detaching the label 101 to be applied to the bottle 2.

[0077] Each label has a sticking face and a visible face on the opposite side. When the label 101 reaches the inversion plate the sticking face is facing towards the carrousel 100.

[0078] At the moment of detachment the label 101 is initially only partly detached from the web 103, and therefore is only supported by the part which is still connected to the web 103. The label detaches from the web 103 until only one end of the label remains connected to the web 103, as shown in Figure 4.

[0079] Then when the first roller 24 is at a tangent to the wall of the bottle 2 the label 101 is completely detached from the web 103 and is interposed between the roller and the wall of the bottle 2. At that moment, the central part of the label is attached to the bottle 2.

[0080] When the label 101 is stuck to the bottle 2, the motor-driven means 45 and the feed means 28 prepare to apply a new label 101 to the next bottle 2. Therefore, the first roller 24 rotates through 360° to return to the position closest to the carrousel 100 at the next bottle 2.

[0081] At this point, two different situations may arise: a first situation in which the time which elapses between the arrival of one bottle 2 and the next at the point T is equal to the time needed by the first roller 24 to travel the circle C maintaining its peripheral speed constant and substantially equal to that of the bottle 2. In a second (more common) situation the time which elapses between the arrival of one bottle 2 and the next at the point T is different (greater or less) than the time needed by the first roller 24 to travel the circle C maintaining its peripheral speed substantially equal to that of the bottle 2.

[0082] In this second situation, the peripheral speed of the first roller 24 must be varied according to its angular position. Therefore, the peripheral speed of the first roller 24 must be kept constant and equal to that of the bottle 2 for the arc B (a condition necessary for correct label 101 sticking), and then the peripheral speed must be varied (while travelling the remaining stretch of the circle) depending on the period of time which elapses between the arrival of one bottle 2 and the next at the tangent point T.

[0083] The time which elapses between the arrival of one bottle 2 and the next at the tangent point T is usually less than the time needed for the first roller 24 to travel the circle C maintaining the peripheral speed of the first

roller 24 equal to that of the bottle 2. In this case, to keep the first roller 24 and each bottle 2 synchronised, the coordinating and synchronising control unit issues a command to increase the speed of the main shaft 21 after the first roller 24 has travelled the arc B (and the label 101 has been applied) and before it returns to travel the arc B again to reach the point T again. The increase in the speed of the main shaft 21 results in an increase in the peripheral speed of the first roller 24.

[0084] For example, it may be assumed that two bottles 2 are positioned on the carrousel 100 one after another. When the first bottle 2 reaches the operating head 10 the first roller 24 is travelling the arc B. At this moment, the peripheral speeds of the first roller 24 and the bottle 2 are substantially equal. At this moment the main shaft 21 is rotating at a first speed. At the same time the label 101 arrives and is applied to the bottle 2 at the tangent point T between the first roller 24 and the wall of the bottle 2. After application of the label 101 the coordinating and synchronising control unit issues a command to the motor-driven means 45 to increase the speed so that the main shaft 21 reaches a second speed which is greater than the first speed. Consequently, the first roller 24 reaches a greater peripheral speed and continues the revolution about the main shaft 21. When the first roller 24 again reaches the arc B, the control unit issues a command to the motor-driven means 45 to reduce the speed so that the main shaft 21 returns to the first speed and so that the peripheral speed of the first roller 24 is substantially equal to that of the bottle 2.

[0085] Therefore, in the first embodiment to vary the peripheral speed of the first roller 24, when necessary, the speed of rotation of the main shaft 21 is varied whilst the radius of the circle C remains constant.

[0086] In the second embodiment it is the radius of the circle C which varies, by moving, during a revolution, the connecting point P between the main shaft 21 and the rod 17. Therefore, in this second embodiment, to vary the peripheral speed of the first roller 24 it is not necessary to vary the speed of the main shaft 21. Instead, it is sufficient to vary the radius of the circle C (keeping the speed of the main shaft 21 constant). If the radius is reduced the peripheral speed of the first roller 24 falls, whilst if the radius is increased the peripheral speed of the first roller increases. Therefore, it will be possible to reduce the radius when the first roller 24 travels the arc B, and increase the radius when the first roller 24 travels the remaining part of the circle C.

[0087] This invention also relates to a method for applying self-adhesive labels 101 on the walls of containers, in particular bottles 2.

[0088] The method comprises a first operating step of positioning the containers (bottles 2) on a machine of the type with a rotary carrousel 100, at the outer edge of the carrousel 100. As already indicated, the carrousels of machines for processing bottles 2 usually have a plurality of plates which are positioned along the outer edge of the carrousel 100. Each plate 102 is designed to receive a bottle 2 to be processed.

[0089] The method also comprises mounting a label 101 application station in a position around the carrousel 100. The label 101 application station comprises an application portion 16 which can operate on the bottles 2 to apply labels 101.

[0090] Another step comprises feeding at least one label 101 to the application portion 16. Said label 101 feeding is synchronised with the rotation of the carrousel 100 in such a way that when a bottle 2 reaches the application portion 16 a label 101 is dispensed.

[0091] According to this method, there is a step of moving the application portion 16 along at least an arc B of a circle C which, at a tangent point T, is at a tangent at least to a wall of a container positioned on the carrousel 100 and at the application portion 16. In the preferred embodiment the application portion 16 is a roller able to rotate 360° about a main axis.

[0092] The method according to this invention also comprises applying a label 101 to the wall of a container during the step of moving the application portion 16 to the point T where the application portion 16 and the wall of the bottle 2 are at a tangent to each other.

[0093] Advantageously, during the step of moving the application portion 16 the peripheral speed of the application portion 16 is controlled so that it is substantially equal to the peripheral speed of the wall of the container on which the label 101 is to be applied at the tangent point T.

[0094] This invention brings important advantages.

[0095] First, the device for applying self-adhesive labels 101 guarantees optimum sticking, avoiding wrinkles in the label 101.

[0096] Second, the device for applying self-adhesive labels 101 has overall dimensions which are smaller than those of prior art devices.

[0097] It should also be noticed that this invention is relatively easy to produce and that even the cost linked to implementing the invention is not very high.

Claims

1. A device (1) for applying self-adhesive labels (101) on the walls of containers, in particular bottles (2), the device (1) being operatively connectable to an operating machine of the type with a rotary carrousel (100) on which, in practice, the containers are positioned; comprising:

   a supporting body (3) extending from a first end (4) connected to a basic mechanical unit to a second end (5) which is close to the rotary carrousel (100);

   at least one operating head (10) connected to the supporting body (3) at the second end (5) and which can operate on a container positioned on the carrousel (100), in such a way that it is

synchronised with the movement of the carrousel (100); the operating head (10) comprising an application portion (16) which, in practice, directly interacts with the walls of a container;
label feed means (28) for feeding a web (103) comprising labels (101) to bring at least one label (101) at a time to the operating head (10); there being the possibility of synchronising the label feed means (28) with the movement of the carrousel (100); the label feed means (28) comprising a feeding roller (29) for storing the web (103) to be used, and a receiving roller (30) for receiving the web (103) once the labels (101) have been removed from it; the web (103) following a feed path from the feeding roller (29) to the receiving roller (30);
guide means (31) for guiding the web (103) from the feeding roller (29) to the operating head (10) and from the operating head (10) to the receiving roller (30);
wherein the application portion (16) of the operating head (10) can move along an arc (B) of a circle (C) which at a tangent point (T) is at a tangent at least to a wall of a container positioned on the carrousel (100) and at the operating head (10);
characterised in that the guide means (31) comprise an inversion plate (33) positioned along the web (103) feed path and mounted on the operating head (10); the inversion plate (33) comprising an away surface (34), a return surface (35) which is substantially parallel with and opposite the away surface, and a detaching edge (36) between the two surfaces; the web (103) releasing the labels (101) at the detaching edge (36) as it passes from the away surface (34) to the return surface.

2. The device according to claim 1, **characterised in that** in operating conditions the peripheral speed of the application portion (16) is controlled so that it is substantially equal to the peripheral speed of the wall of the container on which the label (101) is to be applied at the tangent point (T).

3. The device (1) according to either of the foregoing claims, **characterised in that** the operating head (10) comprises a rod (17) having a first end (18), a second end (19) and a central part (20) between the two ends; the rod (17) being able to rotate relative to the rest of the operating head (10) about a main shaft (21) passing through the central part (20) and substantially parallel with the label (101) application wall; the application portion (16) being positioned at the first end (18) of the rod (17).

4. The device (1) according to claim 3, **characterised in that** the application portion (16) is a first roller (24) able to rotate idly about a secondary shaft (25); the secondary shaft (25) being mounted at the first end (18) of the rod (17) and being substantially parallel with the main shaft (21).

5. The device (1) according to claim 4, **characterised in that** the operating head (10) comprises a connecting element (26) and a bar (27); the bar (27) being mounted on the second end (19) of the rod (17) in such a way that it is substantially parallel with the secondary shaft (25); the connecting element (26) being mounted between the bar (27) and the secondary shaft (25) in a position opposite to the rod (17).

6. The device (1) according to any of the claims from 3 to 5, **characterised in that** it comprises motor-driven means (45) connected to the main shaft (21) to drive the rotation of the latter; there being the possibility of synchronizing the motor-driven means (45) with the movement of the carrousel (100) so that when a container is close to the operating head (10) the first roller (24) makes contact with the wall of the container.

7. The device (1) according to claim 6, **characterised in that** it comprises a coordinating and synchronising control unit which is operatively connected to the motor-driven means (45), the feed means (28) and the carrousel (100) for synchronising label (101) application operations so that, in operating conditions, the central part of the label (101) is interposed between the application portion (16) and the wall of the container.

8. The device (1) according to claim 7, **characterised in that** it comprises detector means for detecting the position of the application portion (16), the label feed means (28) and the carrousel (100); the detector means being operatively connected to the coordinating and synchronising control unit.

9. The device (1) according to any of the foregoing claims, **characterised in that** it comprises movement means for moving the supporting body (3) towards or away from the container and/or moving the supporting body (3) vertically, shifting the operating head (10) at least along the entire height of the bottle (2) and/or rotating the supporting body (3) about a first axis which is transversal to the extension of the main body and/or about a second axis which is transversal to the first axis.

10. A method for applying self-adhesive labels (101) on the walls of containers, in particular bottles (2), comprising the following operating steps:

positioning the containers on a machine of the

type with a rotary carrousel (100) at the outer edge of the carrousel (100);
mounting a label (101) application station (1) in a position around the carrousel (100); said station comprising a supporting body (3) extending from a first end (4) connected to a basic mechanical unit to a second end (5) which is close to the rotary carrousel (100), and at least one operating head (10) connected to the supporting body (3) at the second end and comprising an application portion (16) which can operate on containers, for applying labels (101);
feeding at least one label (101) to the application portion (16); the labels (101) being supported by a web (103);
synchronising the rotation of the carrousel (100) with label (101) feed at the application portion (16);
moving the application portion (16) along an arc (B) of a circle (C) which, at a tangent point (T) is at a tangent at least to a wall of a container positioned on the carrousel (100) at the application portion (16);
and whereby a label (101) is applied to the wall of a container during the step of moving the application portion (16);
characterised in that it comprises a step of sliding the web (103) over an away surface (34), a detaching edge (36) and a return surface (35) which is substantially parallel with and opposite the away surface (34), of an inversion plate (33) which is mounted on the operating head (10), and releasing the labels (101) at the detaching edge (36).

11. The method for applying self-adhesive labels (101) according to claim 10, **characterised in that** during the step of moving the application portion (16) the peripheral speed of the application portion (16) is controlled so that it is substantially equal to the peripheral speed of the wall of the container on which the label (101) is to be applied at the tangent point (T).

Patentansprüche

1. Vorrichtung (1) zum Anbringen von selbstklebenden Etiketten (101) an Behälterwänden, insbesondere Flaschen (2), wobei die Vorrichtung (1) betriebswirksam an eine Bearbeitungsmaschine vom Typ mit Drehkarussell (100) angeschlossen werden kann, auf der die Behälter in der Praxis positioniert werden, umfassend:

einen Haltekörper (3), der sich von einem ersten Ende (4), angeschlossen an eine mechanische Basiseinheit, zu einem zweiten Ende (5) erstreckt, das sich in der Nähe des Drehkarussells (100) befindet;
mindestens einen Bearbeitungskopf (10), angeschlossen an den Haltekörper (3) am zweiten Ende (5), der auf einem Behälter arbeiten kann, positioniert auf dem Karussell (100), sodass er mit der Bewegung des Karussells (100) synchronisiert ist, wobei der Bearbeitungskopf (10) einen Anbringungsabschnitt (16) umfasst, der in der Praxis direkt mit den Wänden eines Behälters interagiert;
Etikettenzuführungsmittel (28) für die Zuführung einer Rolle (103), umfassend Etiketten (101), um mindestens jeweils ein Etikett (101) zum Bearbeitungskopf (10) zu führen, wobei die Möglichkeit besteht, die Etikettenzuführungsmittel (28) mit der Bewegung des Karussells (100) zu synchronisieren, wobei die Etikettenzuführungsmittel (28) eine Zuführungswalze (29) zum Aufbewahren der zu nutzenden Rolle (103) umfassen und eine Aufnahmewalze (30) zur Aufnahme der Rolle (103), nachdem die Etiketten (101) von dieser entfernt wurden, wobei die Rolle (103) einem Zuführungsweg von der Zuführungswalze (29) zur Aufnahmewalze (30) folgt;
Führungsmittel (31) zum Führen der Rolle (103) von der Zuführungswalze (29) zum Bearbeitungskopf (10) und vom Bearbeitungskopf (10) zur Aufnahmewalze (30);
wobei sich der Anbringungsabschnitt (16) des Bearbeitungskopfs (10) entlang eines Bogens (B) eines Kreises (C) bewegen kann, der sich an einem Tangentialpunkt (T) an einer Tangente mindestens zu einer Wand eines Behälters, der auf dem Karussell (100) positioniert ist, und am Bearbeitungskopf (10) befindet;
dadurch gekennzeichnet, dass die Führungsmittel (31) eine Umkehrplatte (33) umfassen, die entlang des Zuführungswegs der Rolle (103) positioniert und am Bearbeitungskopf (10) montiert ist, wobei die Umkehrplatte (33) eine wegführende Oberfläche (34), eine rückführende Oberfläche (35) umfasst, die im Wesentlichen parallel und gegenständig zur wegführenden Oberfläche angeordnet ist, sowie eine Ablösekante (36) zwischen den zwei Oberflächen, wobei die Rolle (103) die Etiketten (101) an der Ablösekante (36) freigibt, wenn sie von der wegführenden Oberfläche (34) zur rückführenden Oberfläche wechselt.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Peripheriegeschwindigkeit des Anbringungsabschnitts (16) unter Betriebsbedingungen so gesteuert wird, dass sie im Wesentlichen gleich der Peripheriegeschwindigkeit der Behälterwand ist, auf der das Etikett (101) am Tangentialpunkt (T) anzubringen ist.

3. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Bearbeitungskopf (10) einen Stab (17) umfasst, aufweisend ein erstes Ende (18), ein zweites Ende (19) und einen mittigen Teil (20) zwischen den zwei Enden, wobei der Stab (17) in der Lage ist, sich relativ zum Rest des Bearbeitungskopfs (10) um eine Hauptwelle (21) durch den mittigen Teil (20) und im Wesentlichen parallel zur Anbringungswand des Etiketts (101) zu drehen, wobei der Anbringungsabschnitt (16) am ersten Ende (18) des Stabs (17) positioniert ist.

4. Vorrichtung (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** der Anbringungsabschnitt (16) eine erste Walze (24) ist, die sich im Leerlauf um eine zweite Welle (25) drehen kann, wobei die zweite Welle (25) am ersten Ende (18) der Stange (17) montiert und im Wesentlichen parallel zur Hauptwelle (21) angeordnet ist.

5. Vorrichtung (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** der Bearbeitungskopf (10) ein Verbindungselement (26) und eine Stange (27) umfasst, wobei die Stange (27) am zweiten Ende (19) des Stabs (17) montiert ist, sodass sie im Wesentlichen parallel zur Hilfswelle (25) angeordnet ist, wobei das Verbindungselement (26) zwischen der Stange (27) und der Hilfswelle (25) in einer zum Stab (17) entgegegengesetzten Position montiert ist.

6. Vorrichtung (1) nach einem der Ansprüche 3 bis 5, **dadurch gekennzeichnet, dass** sie motorisch betriebene Mittel (45) umfasst, die an die Hauptwelle (21) angeschlossen sind, um deren Drehung zu bewirken; wobei die Möglichkeit besteht, die motorisch betriebenen Mittel (45) mit der Bewegung des Karussells (100) zu synchronisieren, sodass die erste Walze (24) einen Kontakt zur Behälterwand herstellt, wenn sich ein Behälter in der Nähe des Bearbeitungskopfs (10) befindet.

7. Vorrichtung (1) nach Anspruch 6, **dadurch gekennzeichnet, dass** sie eine Koordinierungs- und Synchronisierungssteuereinheit umfasst, die betriebswirksam an die motorisch betriebenen Mittel (45), die Zuführungsmittel (28) und das Karussell (100) angeschlossen ist, um die Vorgänge zum Anbringen der Etiketten (101) zu synchronisieren, sodass der mittige Teil des Etiketts (101) unter Betriebsbedingungen zwischen dem Anbringungsabschnitt (16) und der Behälterwand eingesetzt ist.

8. Vorrichtung (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** sie Erfassungsmittel umfasst, um die Position des Anbringungsabschnitts (16), der Etikettenzuführungsmittel (28) und des Karussells (100) zu erfassen, wobei die Erfassungsmittel betriebswirksam an die Koordinierungs- und Synchronisierungssteuereinheit angeschlossen sind.

9. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie Bewegungsmittel umfasst, um den Haltekörper (3) zum Behälter hinführend oder von diesem wegführend zu bewegend und/oder um den Haltekörper (3) vertikal zu bewegen und den Bearbeitungskopf (10) mindestens entlang der gesamten Höhe der Flasche (2) zu verschieben und/oder um den Haltekörper (3) um eine erste Achse zu drehen, die quer zur Ausdehnung des Hauptkörpers verläuft, und/oder um eine zweite Achse, die quer zur ersten Achse verläuft.

10. Verfahren zum Anbringen von selbstklebenden Etiketten (101) an Behälterwänden, insbesondere Flaschen (2), umfassend die folgenden Betriebsschritte:

Positionieren der Behälter auf einer Maschine vom Typ mit Drehkarussell (100) an der äußeren Kante des Karussells (100);
Montieren einer Station (1) zum Anbringen von Etiketten (101) an einer Position rund um das Karussell (100), wobei diese Station einen Haltekörper (3) umfasst, der sich von einem ersten Ende (4), verbunden mit einer mechanischen Basiseinheit, bis zu einem zweiten Ende (5) erstreckt, das sich in der Nähe des Drehkarussells (100) befindet, und mindestens einen Bearbeitungskopf (10), angeschlossen an den Haltekörper (3) am zweiten Ende und umfassend einen Anbringungsabschnitt (16), der auf den Behältern arbeiten kann, um Etiketten (101) anzubringen;
Zuführen von mindestens einem Etikett (101) zum Anbringungsabschnitt (16), wobei die Etiketten (101) von einer Rolle (103) getragen werden;
Synchronisieren der Drehung des Karussells (100) mit der Zuführung des Etiketts (101) am Anbringungsabschnitt (16);
Bewegen des Anbringungsabschnitts (16) entlang eines Bogens (B) eines Kreises (C), der sich an einem Tangentialpunkt (T) an einer Tangente mindestens zu einer Wand eines Behälters, der auf dem Karussell (100) am Anbringungsabschnitt (16) positioniert ist, befindet;
und wobei während des Schritts des Bewegens des Anbringungsabschnitts (16) ein Etikett (101) an der Wand eines Behälters angebracht wird;
dadurch gekennzeichnet, dass es einen Schritt zum Verschieben der Rolle (103) über eine wegführende Oberfläche (34), eine Ablösekante (36) und eine rückführende Oberfläche (35) umfasst, die im Wesentlichen parallel und gegenständig zur wegführenden Oberfläche

(34) angeordnet ist, einer Umkehrplatte (33), die am Bearbeitungskopf (10) montiert ist, wobei die Etiketten (101) an der Ablösekante (36) freigegeben werden.

11. Verfahren zum Anbringen von selbstklebenden Etiketten (101) nach Anspruch 10, **dadurch gekennzeichnet, dass** die Peripheriegeschwindigkeit des Anbringungsabschnitts (16) während des Schritts zum Bewegen des Anbringungsabschnitts (16) so gesteuert wird, dass sie im Wesentlichen gleich der Peripheriegeschwindigkeit der Behälterwand ist, auf der das Etikett (101) am Tangentialpunkt (T) anzubringen ist.

Revendications

1. Dispositif (1) d'application d'étiquettes autoadhésives (101) sur les parois de contenants, en particulier des bouteilles (2), le dispositif (1) étant, en fonctionnement, reliée à une machine opérationnelle du type à carrousel rotatif (100) sur laquelle, lors du mode opératoire, sont positionnés les contenants ; comprenant :

un corps de support (3) se développant d'une première extrémité (4) reliée à une unité mécanique de base à une seconde extrémité (5) située à proximité du carrousel rotatif (100) ;
au moins une tête d'actionnement (10) reliée au corps de support (3) au niveau de la seconde extrémité (5) et qui peut agir sur un contenant positionné sur le carrousel (100) de manière à ce qu'elle soit synchronisée avec le mouvement du carrousel (100) ; la tête d'actionnement (10) comprenant une partie d'application (16) qui, lors du mode opératoire, interagit directement avec les parois d'un contenant ;
des moyens d'alimentation en étiquettes (28) servant à alimenter une bande (103), comprenant des étiquettes (101), pour amener au moins une étiquette (101) à la fois à la tête d'actionnement (10) ; avec la possibilité de synchroniser les moyens d'alimentation en étiquettes (28) avec le mouvement du carrousel (100) ; les moyens d'alimentation en étiquettes (28) comprenant un rouleau d'alimentation (29) servant à stocker la bande (103) à utiliser, ainsi qu'un rouleau de réception (30) servant à recevoir la bande (103) une fois que les étiquettes (101) ont été retirées de celle-ci ; la bande (103) suivant une direction d'alimentation du rouleau d'alimentation (29) au rouleau de réception (30) ;
des moyens de guidage (31) servant à guider la bande (103) du rouleau d'alimentation (29) à la tête d'actionnement (10) et de la tête d'actionnement (10) au rouleau de réception (30) ;
dans lequel la partie d'application (16) de la tête d'actionnement (10) peut se déplacer le long d'un arc (B) d'un cercle (C) qui, à un point tangent (T), est tangent à au moins une paroi d'un contenant positionné sur le carrousel (100) et au niveau de la tête d'actionnement (10) ;
caractérisé en ce que les moyens de guidage (31) comprennent une plaque d'inversion (33) positionnée le long de la direction d'alimentation de la bande (103) et montée sur la tête d'actionnement (10) ; la plaque d'inversion (33) comprenant une surface écartée (34), une surface de retour (35) étant substantiellement parallèle et opposée à la surface écartée, ainsi qu'un bord de séparation (36) entre les deux surfaces ; la bande (103) décrochant les étiquettes (101) au niveau du bord de séparation (36) en passant de la surface écartée (34) à la surface de retour.

2. Dispositif selon la revendication 1, **caractérisé en ce qu'**en condition de fonctionnement, la vitesse périphérique de la partie d'application (16) est commandée de manière à ce qu'elle soit substantiellement égale à la vitesse périphérique de la paroi du contenant sur laquelle l'étiquette (101) doit être appliquée au niveau du point tangent (T).

3. Dispositif (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la tête d'actionnement (10) comprend une tige (17) ayant une première extrémité (18), une seconde extrémité (19) et une partie centrale (20) entre les deux extrémités ; la tige (17) pouvant tourner par rapport au reste de la tête d'actionnement (10) autour d'un arbre principal (21) passant à travers la partie centrale (20) et substantiellement parallèle à la paroi d'application de l'étiquette (101) ; la partie d'application (16) étant positionnée au niveau de la première extrémité (18) de la tige (17).

4. Dispositif (1) selon la revendication 3, **caractérisé en ce que** la partie d'application (16) est un premier rouleau (24) pouvant tourner librement autour d'un arbre secondaire (25) ; l'arbre secondaire (25) étant monté à une première extrémité (18) de la tige (17) et étant substantiellement parallèle à l'arbre principal (21).

5. Dispositif (1) selon la revendication 4, **caractérisé en ce que** la tête d'actionnement (10) comprend un élément de raccordement (26) et une barre (27) ; la barre (27) étant montée sur la seconde extrémité (19) de la tige (17) de manière à ce qu'elle soit substantiellement parallèle à l'arbre secondaire (25) ; l'élément de raccordement (26) étant monté entre la barre (27) et l'arbre secondaire (25) dans une position opposée à la tige (17).

6. Dispositif (1) selon l'une quelconque des revendications de 3 à 5, **caractérisé en ce qu'**il comprend des moyens motorisés (45) reliés à l'arbre principal (21) pour entraîner la rotation de ce dernier ; avec la possibilité de synchroniser les moyens motorisés (45) avec le mouvement du carrousel (100) de sorte que lorsque un contenant se trouve à proximité de la tête d'actionnement (10), le premier rouleau (24) entre en contact avec la paroi du contenant.

7. Dispositif (1) selon la revendication 6, **caractérisé en ce qu'**il comprend une unité de commande de coordination et de synchronisation étant fonctionnellement reliée aux moyens motorisés (45), aux moyens d'alimentation (28) et au carrousel (100) afin de synchroniser les opérations d'application de l'étiquette (101) de sorte que, en conditions de fonctionnement, la partie centrale de l'étiquette (101) est interposée entre la partie d'application (16) et la paroi du contenant.

8. Dispositif (1) selon la revendication 7, **caractérisé en ce qu'**il comprend des moyens de détection servant à détecter la position de la partie d'application (16), des moyens d'alimentation en étiquettes (28) et du carrousel (100) ; les moyens de détection étant fonctionnellement reliés à l'unité de commande de coordination et de synchronisation.

9. Dispositif (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**il comprend des moyens de déplacement servant à éloigner ou rapprocher le corps de support (3) du contenant et/ou à déplacer le corps de support (3) verticalement, à déplacer la tête de fonctionnement (10) au moins le long de toute la hauteur de la bouteille (2) et/ou à faire tourner le corps de support (3) autour d'un premier axe étant transversal à l'extension du corps principal et/ou autour d'un second axe étant transversal au premier axe.

10. Procédé d'application d'étiquettes autoadhésives (101) sur les parois de contenants, en particulier des bouteilles (2), comprenant les étapes de fonctionnement suivantes :

positionner les contenants sur une machine du type à carrousel rotatif (100) au niveau du bord extérieur du carrousel (100) ;
monter un poste (1) d'application d'étiquettes (101) dans une position située autour du carrousel (100) ;
ledit poste comprenant un corps de support (3) se développant d'une première extrémité (4) reliée à une unité mécanique de base à une seconde extrémité (5) étant située à proximité du carrousel rotatif (100), et au moins une tête d'actionnement (10) reliée au corps de support (3) au niveau de la seconde extrémité et comprenant une partie d'application (16) pouvant agir sur les contenants, pour appliquer les étiquettes (101) ;
acheminer au moins une étiquette (101) vers la partie d'application (16) ; les étiquettes (101) étant supportées par une bande (103) ;
synchroniser la rotation du carrousel (100) avec l'alimentation en étiquettes (101) au niveau de la partie d'application (16) ;
déplacer la partie d'application (16) le long d'un arc (B) d'un cercle (C) qui, à un point tangent (T), est tangent à au moins une paroi d'un contenant positionné sur le carrousel (100) au niveau de la partie d'application (16) ;
et dans lequel une étiquette (101) est appliquée à la paroi d'un contenant lors de la phase de déplacement de la partie d'application (16) ;
caractérisé en ce qu'il comprend une étape de coulissement de la bande (103) au-dessus d'une surface écartée-(34), un bord de séparation (36) ainsi qu'une surface de retour (35) étant substantiellement parallèle et opposée à la surface écartée (34) d'une plaque d'inversion (33) étant montée sur la tête d'actionnement (10), et décrochant les étiquettes (101) au niveau du bord de séparation (36).

11. Procédé d'application d'étiquettes autoadhésives (101) selon la revendication 10, **caractérisé en ce que** lors de l'étape de déplacement de la partie d'application (16), la vitesse périphérique de la partie d'application (16) est commandée de manière à ce qu'elle soit substantiellement égale à la vitesse périphérique de la paroi du contenant sur laquelle l'étiquette (101) doit être appliquée au niveau du point tangent (T).

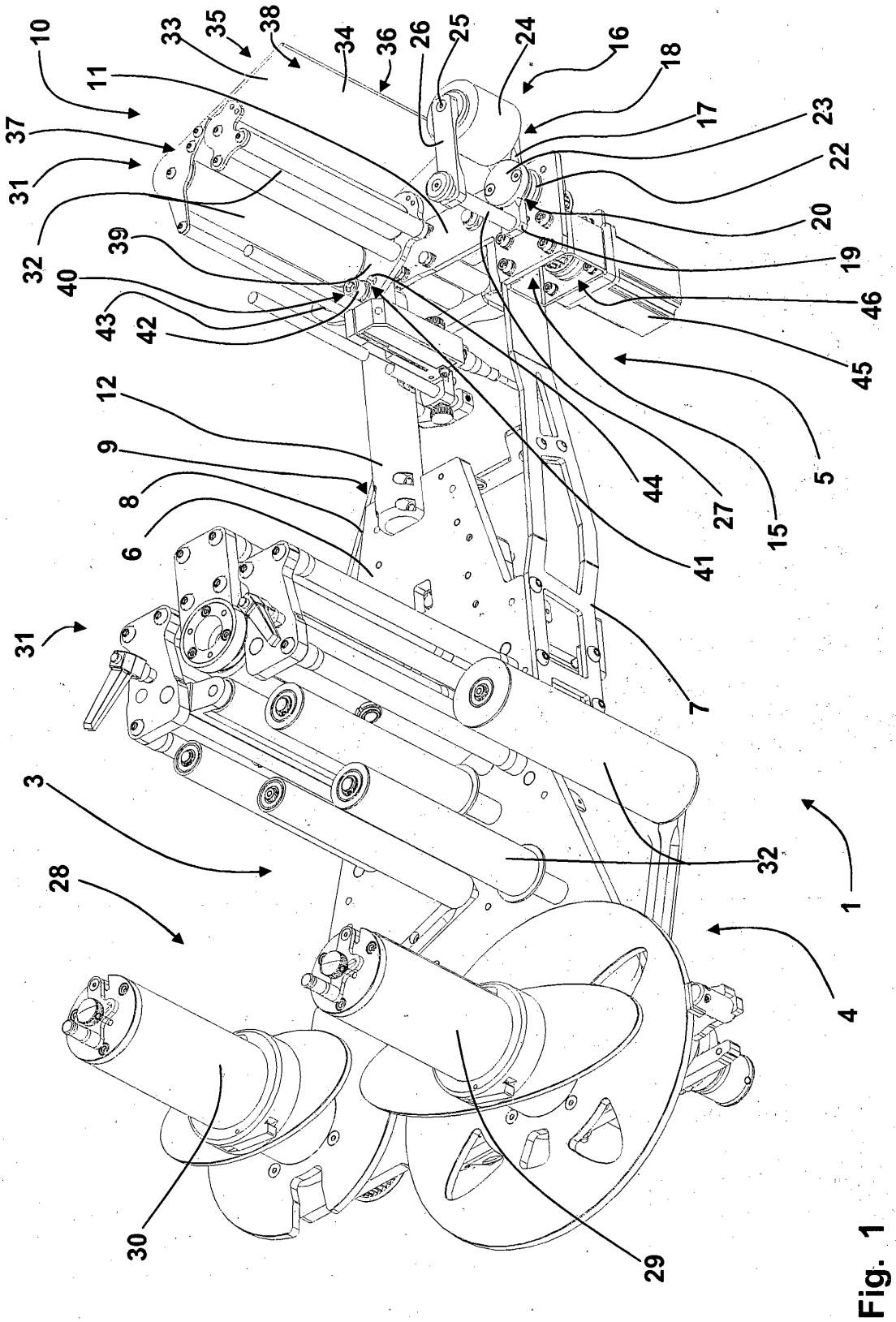

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Fig. 1

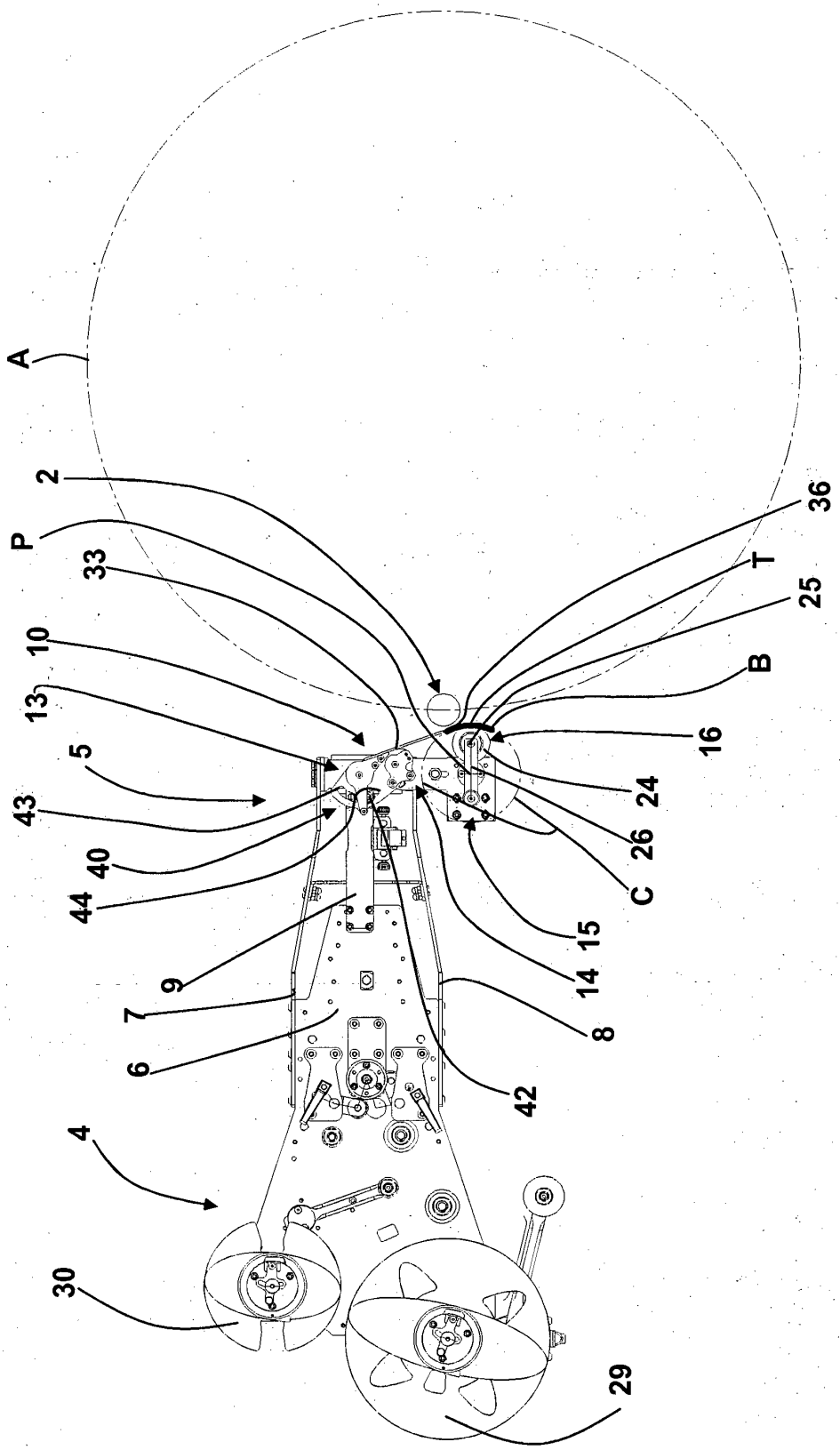


Fig. 2

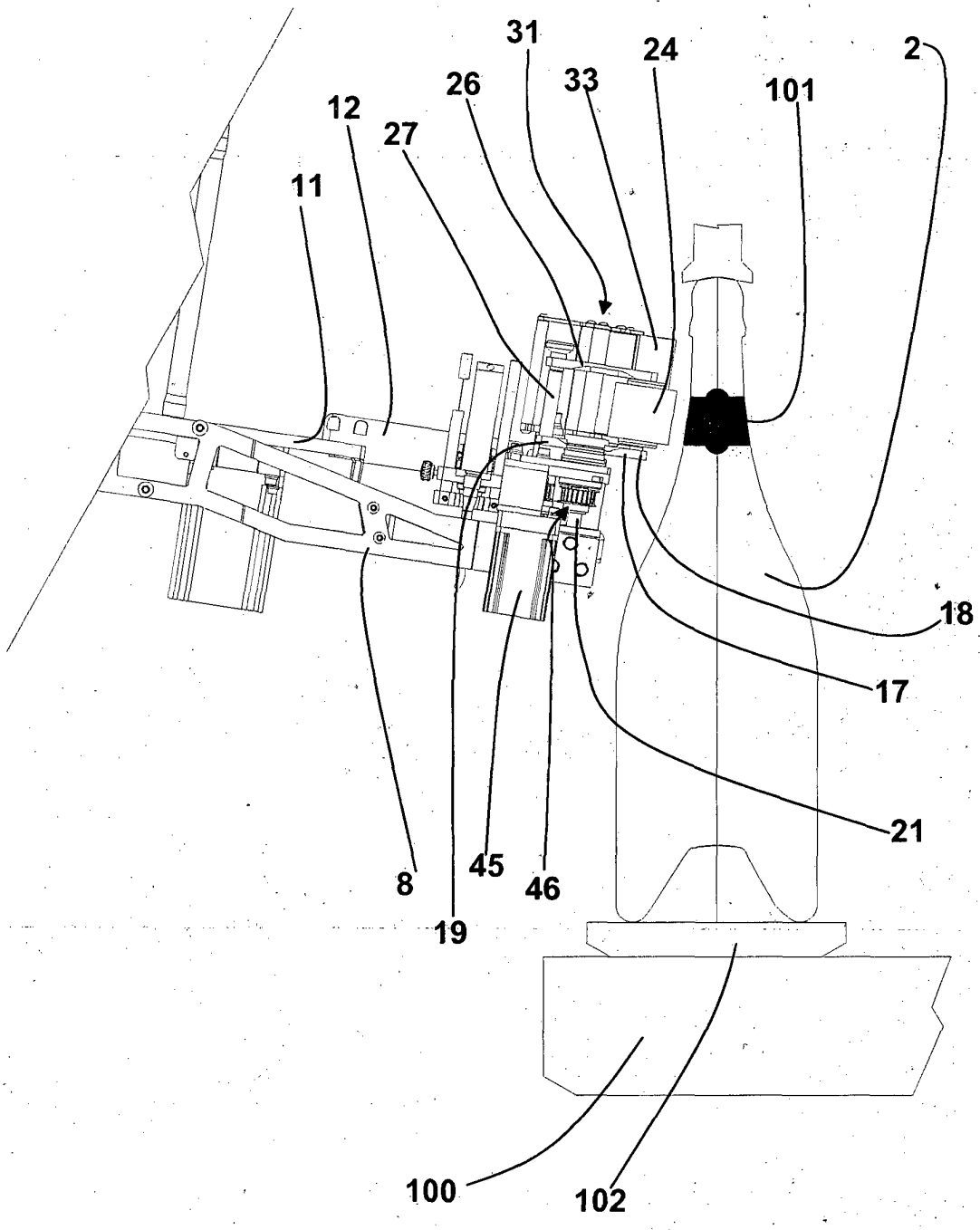


Fig. 3

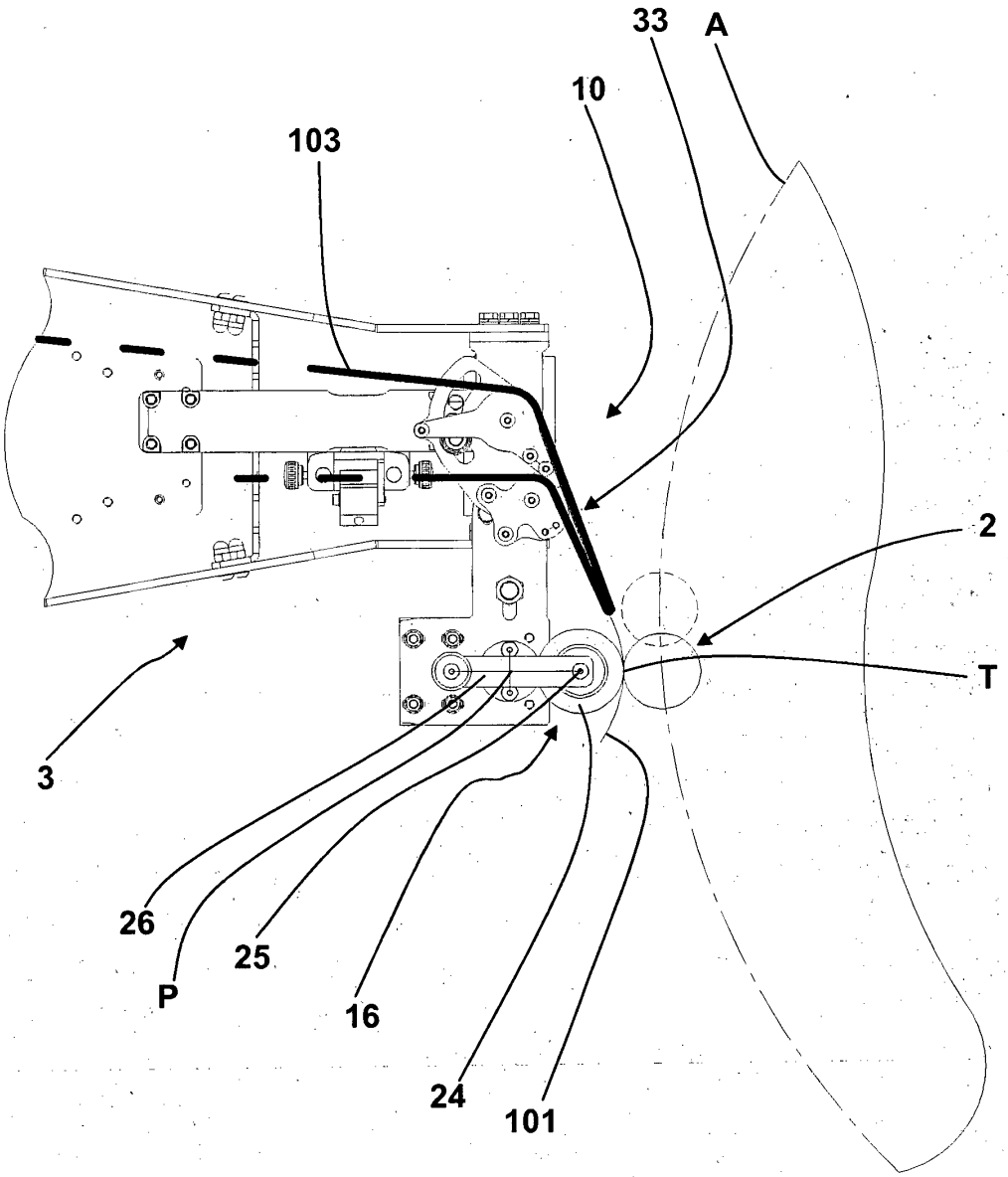


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2004045955 A **[0001]**
- IT VR940055 **[0008]**