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(54) **LABELLING MACHINE**
ETIKETTIERUNGSGERÄT
MACHINE À ÉTIQUETER

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Description

Technical Field

[0001] This invention relates to a labelling machine of the type with a rotary carousel, and in particular to a labelling machine with variable set-up, that is to say, a machine of the type equipped with a plurality of labelling devices which can be placed in various positions along the edge of the carousel. A labelling machine and a method for management of a labelling machine in accordance with the preamble of claims 1 and 12 respectively, are known from GB 2 138 388.

Background Art

[0002] Examples of a such a type of machine are described in patents WO 2005/011363, US 4 362 594 and GB 2 138 388 and in recent patent application PCT/IT2009/000398 by the same Applicant.

[0003] In general, the labelling machines for which this invention is intended comprise a supporting frame on which a carousel is mounted in such a way that it can rotate about a vertical axis of rotation. The edge of the carousel is equipped with a plurality of supporting means, such as plates, for items to be labelled.

[0004] The machine also comprises means for moving the carousel relative to the frame and, if necessary, the supporting means relative to the carousel.

[0005] Feeding of products to be labelled to the supporting means and subsequent removal of labelled products are guaranteed respectively by feed means and by pick up means (both usually consisting of a transfer star-wheel coupled with a product feed track).

[0006] Positioned around the carousel there is at least one labelling device which is designed in practice to apply labels to objects placed on the supporting means which pass it during carousel rotation. In the labelling machines for which this invention is intended, the labelling device is removably connected to the frame so that it can be freely positioned in different angular positions relative to the carousel axis of rotation. In general, this is done by fastening the labelling device to a circular track which is integral with the frame and substantially extends along the edge of the carousel. Suitable actuator means guarantee operation of the labelling device.

[0007] Moreover, in the case of more complex machines, there are two or more labelling devices distributed along the edge of the carousel for applying two or more labels to the same products.

[0008] Finally, the entire machine operation is controlled by at least one control unit which is operatively connected at least to the movement means and to the actuator means for controlling their operation in a synchronised way.

[0009] With the prior art labelling machines, when the size or type of container to be labelled has to be changed, the labelling devices must be moved to a different posi-

tion. However, each time that is done, the control unit must be reprogrammed, in particular in the case of the machine described in patent application No. PCT/IT2009/000398 where each labelling device may be placed in any position around the carousel.

[0010] Obviously, in order to reprogram the machine the position of each of the labelling devices must be known.

[0011] However, reprogramming is a lengthy operation which is exposed to the risk of operator error. Before continuing production some operating tests are always necessary to check that everything is in order.

[0012] Consequently, prior art machines with variable set-up are greatly disadvantaged in terms of productivity if size change-operations are often needed.

Disclosure of the Invention

[0013] In this situation the technical purpose which forms the basis of this invention is to provide a labelling machine which overcomes the above-mentioned disadvantages.

[0014] In particular, the technical purpose of this invention is to provide a labelling machine with variable set-up which allows size change-overs to be performed must faster than for prior art machines.

[0015] This invention also has for a technical purpose to provide a labelling machine in which after moving the labelling devices a minimum number of operations is required before being able to continue production.

[0016] The technical purpose specified and the aims indicated are substantially achieved by a labelling machine as described in the appended claims.

Brief Description of the Drawings

[0017] Further features and the advantages of this invention are more apparent in the detailed description, with reference to the accompanying drawings which illustrate several preferred, non-limiting embodiments of a labelling machine, in which:

- Figure 1 is an axonometric view partly from above of a labelling machine of the type to which this invention can be applied;
- Figure 2 shows the labelling machine of Figure 1 with some parts cut away and others moved; and
- Figure 3 is a schematic top view of the invention applied to a labelling machine of the type illustrated in Figure 1.

Detailed Description of the Preferred Embodiments of the Invention

[0018] With reference to the accompanying drawings the numeral 1 denotes as a whole a labelling machine made in accordance with this invention.

[0019] Similarly to the prior art machines, this machine

according to this invention comprises first a supporting frame 2 on which a carrousel 3 (visible in Figure 1) is mounted in such a way that it can rotate about a vertical axis of rotation X. The edge of the carrousel 3 is equipped with a plurality of supporting means 4 for the objects to be labelled. In the embodiment illustrated, the supporting means 4 are plates which can rotate about their own vertical central axes. The movement of the carrousel 3 relative to the frame 2 and the movement of the supporting means 4 relative to the carrousel 3 are guaranteed by suitable movement means 5 (the accompanying drawings show only the carrousel movement motor). Moreover, the two movements are advantageously synchronised. In particular, in the preferred embodiment of this invention that is done using different electronically-controlled motors for the movement of the carrousel 3 and for the movement of the individual plates, and using an "electronic cam", that is to say, a synchronised electronic control for the individual motors.

[0020] Figure 1 also shows how the carrousel 3, in the known way, comprises a lower part 6 which supports the plates and an upper part 7 to which there is connected a part of the supporting means 4 (not visible) which is designed to retain the upper part of the products to be labelled (not illustrated). Said upper part 7 of the carrousel 3 is supported by an upper part 8 of the frame 2.

[0021] The machine also comprises means 9 for feeding the objects to be labelled to the supporting means 4 and means 10 for picking up the labelled objects from the supporting means 4, both of the known type. The feed means 9 and the pickup means 10 are schematically illustrated in Figure 3. As can be seen, both comprise a transfer star-wheel 11 interposed between the carrousel 3 and a feed track 12 for the products to be labelled. In addition, the feed means 9 comprise a screw feeder 13 designed to space out the products by the correct step, allowing them to be picked up by the transfer star-wheel 11.

[0022] At least one labelling device 14 (two in the accompanying Figures 1 and 2) is positioned radially along the edge of the carrousel 3 and in practice applies labels to the objects placed on the supporting means 4 which pass it during carrousel 3 rotation. In particular, the labelling device 14 is removably connected to the frame 2 so that it can be freely positioned in different angular positions relative to the carrousel 3 axis of rotation X. In the embodiment illustrated in Figure 1, this is achieved thanks to the fact that the supporting frame 2 comprises a sliding track 15 extending along an arc of a circle centred on the axis of rotation X and also thanks to the fact that each labelling device 14 can be connected to the track 15 in any angular position. In particular, as Figure 2 shows more clearly, each labelling device 14 is connected to the frame 2 by an interface element 16 which can be slidably fastened to the frame 2 track 15. The labelling device 14 is coupled with the interface element 16 only at the moment when the latter has been brought into the correct position and locked relative to the frame

2 (the structure is described in detail in patent application No. PCT/IT2009/000398). In any case the specific method for positioning the labelling devices 14 and coupling them to the frame 2 is not limiting for the purposes of this invention.

[0023] Actuator means 17 are connected to the labelling device 14 for making it operate and so apply the labels.

[0024] The entire machine operation is controlled by at least one control unit (not visible in the accompanying drawings) which is operatively connected at least to the movement means 5 and to the actuator means 17 for controlling their operation in a synchronised way. In general, the control unit comprises at least one CPU and is programmed (in the known way) to create a set of synchronised movements by the carrousel 3, supporting means 4 and labelling devices 14 which allows correct application of the label on the products. Advantageously, the control unit is also operatively connected to the feed means 9 and to the pickup means 10 for controlling their operation in a way synchronised with the movement means 5.

[0025] According to this invention, control unit programming has been made dependent on a variable parameter, the position of the labelling device 14 relative to the carrousel 3.

[0026] For that purpose, according to this invention, the labelling machine 1 comprises means (not illustrated) for detecting the angular position of the labelling device 14 relative to the axis of rotation X, the detection means being operatively connected to the control unit. In general, said detection means identify the angular position of the labelling device 14 relative to a reference point integral with the frame 2 and they transmit the information to the control unit.

[0027] The latter is programmed first to save said labelling device 14 angular position detected by the detection means, as the "position detected" (it should be noticed that saving may also be of the implicit type). Second, the control unit is programmed to control the movement means 5 and the actuator means 17 depending on the position detected which is saved.

[0028] Moreover, in the preferred embodiment the machine comprises means 18 for identifying the labelling device 14 which in turn comprise at least a first element 19 (shown in three different positions in Figure 3) and at least a second element 20.

[0029] The first element 19 can rotate about the axis of rotation X, whilst the second element 20 is integral with the labelling device 14 (directly or by means of the interface element 16). The first element 19 and the second element 20 are also positioned in such a way that they are operatively coupled with each other when the labelling device 14 is connected to the frame 2 and the first element 19 is in an angular position, relative to the axis of rotation X, corresponding to that of the second element 20. In other words, the two elements 19, 20 are advantageously operatively coupled when they are coplanar in

a plane passing through the axis of rotation X and they are located on the same side of the axis. Moreover, advantageously the first element 19 is integral with the carrousel 3.

[0030] At least one out of the first element 19 and the second element 20 is operatively connected to the control unit for indicating to it when the two elements 19, 20 are operatively coupled (at that moment the first element 19 is in the same angular position as the labelling device 14). For that purpose, the first element 19 and the second element 20 consist one of a sensor connected to the control unit, and the other of an element which can be detected by the sensor.

[0031] To provide the reference point for identifying the position detected, the identification means 18 also comprise at least a third element 21 which is fixed relative to the supporting frame 2 and is operatively coupled with the first element 19, in the sense indicated above, at a predetermined angular position of the first element 19 relative to the axis of rotation X. In the embodiment illustrated, the third element 21 is positioned at the tangent point between the feed means 9 transfer star-wheel 11 and the carrousel 3 (said location is advantageous since it coincides with the start of the path of the products to be labelled on the carrousel 3).

[0032] The detection means in turn detect the angular position of the labelling device 14, detecting the angular position of the first element 19 relative to the axis of rotation X. Advantageously, the detection means comprise an encoder (not illustrated) connected to the control unit and operatively connected to the first element 19 (and/or with the carrousel 3 if the first element 19 is integral with it) for calculating its angular movement relative to the reference point.

[0033] In the preferred embodiment, the control unit is programmed to save as the position detected the angular position of the first element 19, detected by the detection means when the identification means 18 indicate that the first element and the second element 20 are operatively coupled, and to control the movement means 5 and the actuator means 17 depending on the positioned detected which is saved in this way.

[0034] Figure 3 shows the case in which a labelling device 14 is moved from a first position (on the right in the drawing) to a second position (on the left). Before being moved, the device is in a first angular position rotated by a first angle α relative to the reference angle (angle 0) identified by the fixed third element 21. The movement consists of a rotation about the axis of rotation X according to the arrow F, by a second angle β relative to the starting position. Once the labelling device 14 has been positioned, the carrousel 3, on which the first element 19 is mounted, is made to rotate. At the moment when the first element 19 is operatively coupled with the third element 21, the relative angular position is recognised as the reference point and the encoder begins counting the pulses until the first element 19 encounters the second element 20. At that moment the angular po-

sition calculated by the encoder (equal to the sum of the first angle α and the second angle β) is taken as the position detected and is processed by the control unit which applies new parameters to its programming based on the positioned detected.

[0035] Moreover, depending on the embodiments, the control unit may be programmed to save the position detected for each labelling device 14 with each rotation of the carrousel 3 (thus guaranteeing continuous updating of the machine status) or only after a specific command which can be given by the operator after moving the labelling device 14.

[0036] Since each type of labelling device 14 requires specific programming for coordination of the various moving parts, in some more complex embodiments the second element 20 of the identification means 18 may also represent the type of labelling device 14 to which it is connected. If it is an active element (sensor), the information about the type of device may be saved in it so that it can be transmitted to the control unit as required. If it is an element which can be detected by a sensor it may be made with distinctive features (e.g.: a particular colour in the case of an optical sensor, or a predetermined electromagnetic behaviour for a magnetic sensor).

[0037] In these more complete embodiments, at the moment when the position detected is detected the detection means also detect the type of labelling device 14 and communicate this to the control unit. The latter is therefore programmed to control operation of the movement means 5 and the actuator means 17 partly depending on the type of labelling device 14 detected by the detection means.

[0038] For simplicity, up to this moment reference was made to a labelling machine 1 comprising only one labelling device 14.

[0039] However, in practice, in the more complete embodiments the machine is equipped with a series of labelling devices 14, and at least a plurality of them can be placed in two or more positions relative to the carrousel 3. In this case, the detection means comprise at least one second element 20 connected to each movable labelling device 14, and the control unit is programmed as indicated above for each movable labelling device 14.

[0040] By way of example, Figures 1 and 2 show a machine equipped with two labelling devices 14, one device 141 for applying adhesive labels and a cold glue application device 142.

[0041] This invention also relates to the method for managing a labelling machine 1 of the type with variable set-up described above.

[0042] The method according to this invention relates to setting up the machine after each movement of a labelling device 14 relative to the carrousel 3.

[0043] The method involves various operating steps.

[0044] The first step is to programme the control unit with a program which is expressed according to a variable representing the angular position of the labelling device 14 relative to the axis of rotation X and a fixed reference

point. Thus the program must be such that it controls the "electronic cam" based on said variable. The start and end of each machine movement will therefore be expressed not with reference to the absolute position of the carrousel 3, but with reference to a differential position of the carrousel 3 relative to the angular position of each labelling device 14 (in other words, each position of the carrousel 3 will be expressed in terms of before or after the angular position of each labelling device 14).

[0045] Once the control unit has been programmed in this way, the management method involves, after each movement of one of the labelling devices 14 present, the angular position of the labelling device 14 moved (or, advantageously of all of them) relative to the fixed reference point being detected and saved as the position detected.

[0046] At that point the method involves entering the position detected in the program as the value to be assigned to the relative variable and using the machine with the program obtained in this way.

[0047] Obviously, the management method described herein is advantageously applied in the labelling machine 1 previously described in detail, but not only in that case.

[0048] Operation of the machine is similar to that of prior art machines and is not described in detail herein.

[0049] This invention brings important advantages.

[0050] Thanks to this invention, the machine set-up process after a size changeover involving movement of the labelling devices 14, can be carried out in just a few seconds with significant benefits in terms of productivity.

[0051] Secondly, any set-up errors can be avoided. Finally, thanks to the use of the control at a programming level, it is also possible to identify any labelling device 14 positioning errors (each type of device requires a predetermined amount of free space before and after it - along the path of the products to be labelled - to guarantee correct label application).

[0052] 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 labelling machine comprising:

a supporting frame (2);
a carrousel (3) mounted on the supporting frame (2) in such a way that it can rotate about a vertical axis of rotation (X), the edge of the carrousel being equipped with a plurality of supporting means (4) for the objects to be labelled;
means (5) for moving the carrousel (3) relative to the frame (2) and, if necessary, the supporting means (4) relative to the carrousel (3);
means (9) for feeding the objects to be labelled to the supporting means (4) and means (10) for picking up the labelled objects from the support-

ing means (4); and

at least one labelling device (14) positioned radially along the edge of the carrousel (3) for applying labels to the objects placed on the supporting means (4) which pass it during carrousel (3) rotation; the labelling device (14) being removably connected to the frame (2) so that it can be freely positioned in different angular positions relative to the carrousel (3) axis of rotation (X);

actuator means (17) for the labelling device (14);
at least one control unit which is operatively connected at least to the movement means (5) and to the actuator means (17) for controlling their operation in a synchronised way;

the machine being **characterised in that** it also comprises means for detecting the angular position of the labelling device (14) relative to the axis of rotation (X), the detection means being operatively connected to the control unit, and also being **characterised in that** the control unit is programmed for:

saving the labelling device (14) angular position detected by the detection means as the position detected; and
controlling the movement means (5) and the actuator means (17) depending on the position detected which is saved.

2. The labelling machine according to claim 1, **characterised in that** it also comprises:

means (18) for identifying the labelling device (14) comprising at least a first element (19), able to rotate about the axis of rotation (X), and at least a second element (20) which is integral with the labelling device (14), the first element and the second element (20) being positioned in such a way that they are operatively coupled when the labelling device (14) is connected to the frame (2) and the first element (19) is in an angular position, relative to the axis of rotation (X), corresponding to that of the second element (20); at least one out of the first element and the second element (20) being operatively connected to the control unit for indicating to it when the two elements are operatively coupled; and
the detection means detecting the angular position of the first element (19) relative to the axis of rotation (X);

and also being **characterised in that** the control unit is programmed for:

saving as the position detected the angular position of the first element (19), detected by the detection means when the identification means (18) indicate to it that the two

elements are operatively coupled.

3. The labelling machine according to claim 2, **characterised in that** the first element (19) and the second element (20) consist one of a sensor connected to the control unit, and the other of an element which can be detected by the sensor. 5
4. The labelling machine according to claim 2 or 3, **characterised in that** the identification means (18) also comprise at least a third element (21) which is fixed relative to the supporting frame (2) and operatively coupled with the first element (19) at a predetermined angular position of the first element (19) relative to the axis of rotation (X), the third element (21) forming a reference point for identifying the position detected. 10
5. The labelling machine according to any of the claims from 2 to 4, **characterised in that** the detection means comprise an encoder connected to the control unit and operatively connected to the first element (19) for calculating its angular movement. 15
6. The labelling machine according to any of the claims from 2 to 5, **characterised in that** it also comprises an interface element (16) which can be fastened to the frame (2) and to which the labelling device (14) is fastened, the second element (20) of the identification means (18) being mounted on the interface element (16). 20
7. The labelling machine according to any of the claims from 2 to 6, **characterised in that** the second element (20) of the identification means (18) also represents the type of labelling device (14) to which it is connected, also being **characterised in that** at the moment when the position detected is detected the detection means also detect the type of labelling device (14) and communicate it to the control unit, and also being **characterised in that** the control unit is programmed to control operation of the movement means (5) and of the actuator means (17) partly depending on the type of labelling device (14) detected by the detection means. 25
8. The labelling machine according to any of the claims from 2 to 7, **characterised in that** it comprises a plurality of the movable labelling devices (14), also being **characterised in that** the detection means comprise a second element (20) connected to each movable labelling device (14), and also being **characterised in that** the control unit is programmed depending on the position detected for each movable labelling device (14). 30
9. The labelling machine according to any of the foregoing claims, **characterised in that** the control unit 35

is also operatively connected to the feed means (9) and to the pickup means (10) for controlling their operation in a way synchronised with the movement means (5).

10. The labelling machine according to any of the foregoing claims, **characterised in that** the control unit is programmed to save the position detected of each labelling device (14) with each carousel (3) rotation or only after a specific command. 40
11. The labelling machine according to any of the foregoing claims, **characterised in that** the supporting frame (2) comprises a sliding track (15) extending along an arc of a circle centred on the axis of rotation (X) and also being **characterised in that** each labelling device (14) can be connected to the track (15) in any angular position. 45
12. A method for management of a labelling machine (1) comprising: 50

a supporting frame (2);
 a carousel (3) mounted on the supporting frame (2) in such a way that it can rotate about a vertical axis of rotation (X), the edge of the carousel being equipped with a plurality of supporting means (4) for the objects to be labelled;
 means (5) for moving the carousel (3) relative to the frame (2) and, if necessary, the supporting means (4) relative to the carousel (3);
 means (9) for feeding the objects to be labelled to the supporting means (4) and means (10) for picking up the labelled objects from the supporting means (4); and
 at least one labelling device (14) positioned radially along the edge of the carousel (3) for applying labels to the objects placed on the supporting means (4) which pass it during carousel (3) rotation; the labelling device (14) being removably connected to the frame (2) so that it can be freely positioned in different angular positions relative to the carousel (3) axis of rotation (X);
 actuator means (17) for the labelling device (14); and
 at least one control unit which is operatively connected at least to the movement means (5) and to the actuator means (17) for controlling their operation in a synchronised way;
 the method being **characterised in that** it comprises the following operating steps: 55

programming the control unit with a program which is expressed according to one or more variables each representing the angular position of a movable labelling device (14) relative to the axis of rotation (X) and

a fixed reference point;
 at least after each movement of a labelling
 device (14) relative to the carrousel (3), de-
 tecting and saving as the position detected,
 the angular position of the labelling device 5
 (14) relative to the fixed reference point;
 entering the position detected in the pro-
 gram as the value to be assigned to the rel-
 ative variable; and
 using the machine with the program ob- 10
 tained in this way.

Patentansprüche

1. Etikettierungsgerät; enthaltend:

- einen Trägersrahmen (2),
- ein auf solche Weise an dem Trägersrahmen 20
 (2) montiertes Karussell (3), dass es sich um
 eine vertikale Drehachse (X) drehen kann, wo-
 bei der Rand des Karussells mit einer Anzahl
 von Haltemitteln (4) für die zu etikettierenden
 Gegenstände ausgestattet ist;
- Mittel (5) zum Bewegen des Karussells (3) im 25
 Verhältnis zu dem Rahmen (2) und, falls not-
 wendig, der Haltemittel (4) im Verhältnis zu dem
 Karussell (3);
- Mittel (9) zum Zuführen der zu etikettierenden
 Gegenstände zu den Haltemitteln (4) und Mittel 30
 (10) zum Aufnehmen der etikettierten Gegen-
 stände von den Haltemitteln (4); und
- wenigstens eine Etikettiervorrichtung (14), po-
 sitioniert radial entlang dem Rande des Karus- 35
 sells (3), um Etiketten an den an den Haltemit-
 teln (4) angeordneten Gegenständen anzubrin-
 gen, welche während der Umdrehung des Ka-
 russells (3) an dieser vorbeilaufen; wobei die Eti-
 kettiervorrichtung (14) lösbar an den Rahmen 40
 (2) angeschlossen ist, so dass sie beliebig in
 verschiedenen Winkelpositionen im Verhältnis
 zu der Drehachse (X) des Karussells (3) posi-
 tioniert werden kann;
- Antriebsmittel (17) für die Etikettiervorrichtung 45
 (14);
- wenigstens eine Steuereinheit, welche betrieb-
 lich wenigstens an die Bewegungsmittel (5) und
 an die Antriebsmittel (17) angeschlossen ist, um
 deren Betrieb in synchronisierter Weise zu steu- 50
 ern;
- wobei das Gerät **dadurch gekennzeichnet ist, dass** es ebenfalls Mittel zum Abtasten der
 Winkelposition der Etikettiervorrichtung (14) im
 Verhältnis zu der Drehachse (X) enthält, wobei
 die Abtastmittel betrieblich an die Steuereinheit 55
 angeschlossen sind, und ebenfalls **dadurch
 gekennzeichnet, dass** die Steuereinheit pro-
 grammiert ist zum:

- Speichern der Winkelposition der Etikettiervor-
 richtung (14), erfasst durch die Abtastmittel als
 die erfasste Position; und
- Steuern der Bewegungsmittel (5) und der An-
 triebsmittel (17), abhängig von der erfassten Po-
 sition, die gespeichert wurde.

2. Etikettierungsgerät nach Patentanspruch 1, **da- durch gekennzeichnet, dass** es ebenfalls enthält:

- Mittel (18) zum Identifizieren der Etikettiervor-
 richtung (14), enthaltend wenigstens ein erstes
 Element (19), das in der Lage ist, sich um die
 Drehachse (X) zu drehen, und wenigstens ein
 zweites Element (20), welches fest mit der Eti-
 kettiervorrichtung (14) verbunden ist, wobei das
 erste Element und das zweite Element (20) auf
 solche Weise positioniert sind, dass sie betrieb-
 lich miteinander verbunden sind, wenn die Eti-
 kettiervorrichtung (14) an den Rahmen (2) an-
 geschlossen ist und sich das erste Element (19)
 sich im Verhältnis zu der Drehachse (X) in einer
 Winkelposition befindet, die jener des zweiten
 Elementes (20) entspricht; wobei wenigstens
 eins von dem ersten Element und dem zweiten
 Element (20) betrieblich an die Steuereinheit an-
 geschlossen ist, um dieser anzuzeigen, wenn
 die beiden Elemente betrieblich miteinander
 verbunden sind; und
- Abtastmittel zum Erfassen der Winkelposition
 des ersten Elementes (19) im Verhältnis zu der
 Drehachse (X);
- und wobei es auch **dadurch gekennzeichnet
 ist, dass** die Steuereinheit programmiert ist
 zum:
- Speichern der Winkelposition des ersten Ele-
 mentes (19) als erfasste Position, erfasst durch
 das Abtastmittel, wenn die Identifiziermittel (18)
 diesem anzeigen, dass die beiden Elemente be-
 trieblich miteinander verbunden sind.

3. Etikettierungsgerät nach Patentanspruch 2, **da- durch gekennzeichnet, dass** das erste Element (19) und das zweite Element (20) eins aus einem an die Steuereinheit angeschlossenen Fühler und das andere aus einem Element bestehen, das durch den Fühler erfasst werden kann.

4. Etikettierungsgerät nach Patentanspruch 2 oder 3, **dadurch gekennzeichnet, dass** die Identifiziermit- tel (18) ebenfalls wenigstens ein drittes Element (21) enthalten, welches im Verhältnis zu dem Trägersrah- men (2) feststehend und betrieblich mit dem ersten Element (19) verbunden ist, und zwar in einer vorge- gebenen Winkelposition des ersten Elementes (19) im Verhältnis zu der Drehachse (X), wobei das dritte Element (21) einen Bezugspunkt zum Identifi- zieren der erfassten Position bildet.

5. Etikettierungsgerät nach einem jeden der Patentansprüche von 2 bis 4, **dadurch gekennzeichnet, dass** die Abtastmittel einen Encoder enthalten, der an die Steuereinheit angeschlossen und betrieblich mit dem ersten Element (19) verbunden ist, um dessen Winkelbewegung zu berechnen. 5
6. Etikettierungsgerät nach einem jeden der Patentansprüche von 2 bis 5, **dadurch gekennzeichnet, dass** es ebenfalls ein Verbindungselement (16) enthält, welches an dem Rahmen (2) befestigt werden kann und an welchem die Etikettiervorrichtung (14) befestigt ist, wobei das zweite Element (20) der Identifiziermittel (18) an dem Verbindungselement (16) montiert ist. 10
7. Etikettierungsgerät nach einem jeden der Patentansprüche von 2 bis 6, **dadurch gekennzeichnet, dass** das zweite Element (20) der Identifiziermittel (18) auch den Typ von Etikettiervorrichtung (14) darstellt, an welche es angeschlossen ist, wobei es ebenfalls **dadurch gekennzeichnet ist, dass** in dem Moment des Erfassens der erfassten Position die Abtastmittel auch den Typ der Etikettiervorrichtung (14) erfassen und diesen der Steuereinheit anzeigen, und wobei es ebenfalls **dadurch gekennzeichnet ist, dass** die Steuereinheit zum Steuern des Betriebes der Bewegungsmittel (5) und der Antriebsmittel (17) programmiert ist, teilweise abhängig vom Typ der Etikettiervorrichtung (14), der durch die Abtastmittel erfasst wurde. 20
8. Etikettierungsgerät nach einem jeden der Patentansprüche von 2 bis 7, **dadurch gekennzeichnet, dass** es eine Anzahl von beweglichen Etikettiervorrichtungen (14) enthält, und ebenfalls **dadurch gekennzeichnet, dass** die Abtastmittel ein zweites Element (20) enthalten, angeschlossen an jede bewegliche Etikettiervorrichtung (14), wobei es auch **dadurch gekennzeichnet ist, dass** die Steuereinheit abhängig von der für jede bewegliche Etikettiervorrichtung (14) erfasste Position programmiert ist. 25
9. Etikettierungsgerät nach einem jeden der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** die Steuereinheit ebenfalls betrieblich an die Zuführmittel (9) und an die Aufnahmemittel (10) angeschlossen ist, um deren Betrieb auf eine mit den Bewegungsmitteln (5) synchronisierte Weise zu steuern. 30
10. Etikettierungsgerät nach einem jeden der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** die Steuereinheit programmiert ist, um die erfasste Position einer jeden Etikettiervorrichtung (14) bei jeder Umdrehung des Karussells (3) oder nur auf ein spezifisches Kommando hin zu speichern. 35
11. Etikettierungsgerät nach einem jeden der vorstehenden Patentansprüche, **dadurch gekennzeichnet, dass** der Trägerrahmen (2) eine Gleitschiene (15) enthält, die sich entlang einer auf die Drehachse (X) zentrierten Kreisbogen erstreckt, und wobei es ebenfalls **dadurch gekennzeichnet ist, dass** jede Etikettiervorrichtung (14) in jeder beliebigen Winkelposition an der Gleitschiene (15) befestigt werden kann. 40
12. Verfahren zur Handhabung eines Etikettierungsgerätes (1), enthaltend:
- einen Trägerrahmen (2);
 - ein auf solche Weise an dem Trägerrahmen (2) montiertes Karussell (3), dass es sich um eine vertikale Drehachse (X) drehen kann, wobei der Rand des Karussells mit einer Anzahl von Haltemitteln (4) für die zu etikettierenden Gegenstände versehen ist;
 - Mittel (5) zum Bewegen des Karussells (3) im Verhältnis zu dem Rahmen (2) und, falls erforderlich, der Haltemittel (4) im Verhältnis zu dem Karussell (3);
 - Mittel (9) zum Zuführen der zu etikettierenden Gegenstände zu den Haltemitteln (4) und Mittel (10) zum Aufnehmen der etikettierten Gegenstände von den Haltemitteln (4); und
 - wenigstens eine Etikettiervorrichtung (14), die radial entlang dem Rande des Karussells (3) positioniert ist, um Etiketten an den an den Haltemitteln (4) angeordneten Gegenständen anzubringen, welche während der Umdrehung des Karussells (3) an dieser vorbeilaufen; wobei die Etikettiervorrichtung (14) lösbar an den Rahmen (2) befestigt ist, so dass sie frei in verschiedenen Winkelpositionen im Verhältnis zu der Drehachse (X) des Karussells (3) positioniert werden kann;
 - Antriebsmittel (17) für die Etikettiervorrichtung (14); und
 - wenigstens eine Steuereinheit, welche betrieblich wenigstens an die Bewegungsmittel (5) und an die Antriebsmittel (17) angeschlossen ist, um deren Betrieb in synchronisierter Weise zu steuern;
 - wobei das Verfahren **dadurch gekennzeichnet ist, dass** es die folgenden Arbeitsschritte enthält:
 - Programmieren der Steuereinheit mit einem Programm, welches in Übereinstimmung mit einer oder mehreren Variablen ausgedrückt ist, jede die Winkelposition einer beweglichen Etikettiervorrichtung (14) im Verhältnis zu der Drehachse (X) und einen festen Bezugspunkt darstellend;
 - wenigstens nach jeder Bewegung einer Etikettiervorrichtung (14) im Verhältnis zu dem Karus-

sell (3) das Erfassen und Speichern, als erfasste Position, der Winkelposition der Etikettiervorrichtung (14) im Verhältnis zu dem festen Bezugspunkt;

- Eingeben der erfassten Position in das Programm als Wert, welcher der betreffenden Variablen zuzuordnen ist; und

- Benutzung des Gerätes mit dem auf diese Weise erhaltenen Programm.

Revendications

1. Une machine à étiqueter comprenant :

un châssis de support (2) ;

un carrousel (3) monté sur le châssis de support (2) de manière à ce qu'il puisse tourner autour d'un axe de rotation vertical (X), le bord du carrousel étant équipé d'une pluralité de moyens de support (4) pour les objets à étiqueter ;

des moyens (5) pour déplacer le carrousel (3) par rapport au châssis (2) et, si nécessaire, les moyens de support (4) par rapport au carrousel (3) ;

des moyens (9) pour alimenter les objets à étiqueter aux moyens de support (4) et des moyens (10) pour prélever les objets étiquetés desdits moyens de support (4) ;

et

au moins un dispositif d'étiquetage (14) positionné radialement le long du bord du carrousel (3) pour appliquer des étiquettes aux objets, se trouvant sur les moyens de support (4), qui passent à son niveau pendant la rotation du carrousel (3) ; le dispositif d'étiquetage (14) étant associé de façon amovible au châssis (2) de manière à ce qu'il puisse être librement positionné dans diverses positions angulaires par rapport à l'axe de rotation (X) du carrousel (3) ;

des moyens d'actionnement (17) pour le dispositif d'étiquetage (14) ;

au moins une unité de commande qui est opérationnellement reliée au moins aux moyens de déplacement (5) et aux moyens d'actionnement (17) pour en commander le fonctionnement de façon synchronisée ;

la machine étant **caractérisée en ce qu'elle** comprend aussi des moyens pour détecter la position angulaire du dispositif d'étiquetage (14) par rapport à l'axe de rotation (X), lesdits moyens de détection étant opérationnellement reliés à l'unité de commande, et étant aussi **caractérisée en ce que** l'unité de commande est programmée pour :

mémoriser, en tant que position détectée, la position angulaire du dispositif d'étiquetage

(14) détectée par les moyens de détection ; et

commander les moyens de déplacement (5) et les moyens d'actionnement (17) en fonction de ladite position détectée qui a été mémorisée.

2. La machine à étiqueter selon la revendication 1, **caractérisée en ce qu'elle** comprend aussi :

des moyens (18) pour identifier le dispositif d'étiquetage (14) comprenant au moins un premier élément (19), pouvant tourner autour de l'axe de rotation (X), et au moins un deuxième élément (20) qui est solidaire au dispositif d'étiquetage (14), le premier élément et le deuxième élément (20) étant positionnés de manière à ce qu'ils soient opérationnellement accouplés lorsque le dispositif d'étiquetage (14) est associé au châssis (2) et que le premier élément (19) est dans une position angulaire, par rapport à l'axe de rotation (X), correspondant à celle du deuxième élément (20) ; au moins l'un parmi le premier élément et le deuxième élément (20) étant opérationnellement relié à l'unité de commande pour indiquer à celle-ci le moment où les deux éléments sont opérationnellement accouplés ; et

les moyens de détection détectant la position angulaire du premier élément (19) par rapport à l'axe de rotation (X) ;

et étant aussi **caractérisée en ce que** l'unité de commande est programmée pour :

mémoriser, en tant que position détectée, la position angulaire du premier élément (19), détectée par les moyens de détection lorsque les moyens d'identification (18) lui indiquent que les deux éléments sont opérationnellement accouplés.

3. La machine à étiqueter selon la revendication 2, **caractérisée en ce que** le premier élément (19) et le deuxième élément (20) consistent, l'un, en un capteur relié à l'unité de commande et, l'autre, en un élément qui peut être détecté par le capteur.

4. La machine à étiqueter selon la revendication 2 ou 3, **caractérisée en ce que** les moyens d'identification (18) comprennent aussi au moins un troisième élément (21) qui est fixé par rapport au châssis de support (2) et opérationnellement accouplé avec le premier élément (19) au niveau d'une position angulaire prédéfinie de ce même premier élément (19) par rapport à l'axe de rotation (X), le troisième élément (21) définissant un point de référence pour identifier la position détectée.

5. La machine à étiqueter selon l'une quelconque des revendications de 2 à 4, **caractérisée en ce que** les moyens de détection comprennent un encodeur relié à l'unité de commande et opérationnellement associé au premier élément (19) pour en calculer le mouvement angulaire. 5
6. La machine à étiqueter selon l'une quelconque des revendications de 2 à 5, **caractérisée en ce qu'elle** comprend aussi un élément d'interface (16) qui peut être fixé au châssis (2) et auquel est fixé le dispositif d'étiquetage (14), le deuxième élément (20) des moyens d'identification (18) étant monté sur ledit élément d'interface (16). 10
7. La machine à étiqueter selon l'une quelconque des revendications de 2 à 6, **caractérisée en ce que** le deuxième élément (20) des moyens d'identification (18) représente aussi le type de dispositif d'étiquetage (14) auquel il est associé, étant aussi **caractérisée en ce que**, au moment où la position détectée est détectée, les moyens de détection détectent aussi le type de dispositif d'étiquetage (14) et le communiquent à l'unité de commande, et étant aussi **caractérisée en ce que** l'unité de commande est programmée pour commander le fonctionnement des moyens de déplacement (5) et des moyens d'actionnement (17) en partie en fonction du type de dispositif d'étiquetage (14) détecté par les moyens de détection. 15 20 25 30
8. La machine à étiqueter selon l'une quelconque des revendications de 2 à 7, **caractérisée en ce qu'elle** comprend une pluralité desdits dispositifs d'étiquetage (14) mobiles, étant aussi **caractérisée en ce que** les moyens de détection comprennent un deuxième élément (20) associé à chaque dispositif d'étiquetage mobile (14), et étant aussi **caractérisée en ce que** l'unité de commande est programmée en fonction de la position détectée pour chaque dispositif d'étiquetage mobile (14). 35 40
9. La machine à étiqueter selon l'une quelconque des revendications précédentes, **caractérisée en ce que** l'unité de commande est aussi reliée opérationnellement aux moyens d'alimentation (9) et aux moyens de prélèvement (10) pour en commander le fonctionnement de façon synchronisée avec les moyens de déplacement (5). 45 50
10. La machine à étiqueter selon l'une quelconque des revendications précédentes, **caractérisée en ce que** l'unité de commande est programmée pour mémoriser la position détectée de chaque dispositif d'étiquetage (14) à chaque rotation du carrousel (3) ou uniquement après une commande spécifique. 55
11. La machine à étiqueter selon l'une quelconque des

revendications précédentes, **caractérisée en ce que** le châssis de support (2) comprend un rail de glissement (15) s'étendant le long d'un arc de cercle centré sur l'axe de rotation (X) et étant aussi **caractérisée en ce que** chaque dispositif d'étiquetage (14) peut être associé au rail (15) dans n'importe quelle position angulaire.

12. Une méthode de gestion d'une machine à étiqueter (1) comprenant :

un châssis de support (2) ;
 un carrousel (3) monté sur le châssis de support (2) de manière à ce qu'il puisse tourner autour d'un axe de rotation vertical (X), le bord du carrousel étant équipé d'une pluralité de moyens de support (4) pour les objets à étiqueter ;
 des moyens (5) pour déplacer le carrousel (3) par rapport au châssis (2) et, si nécessaire, les moyens de support (4) par rapport au carrousel (3) ;
 des moyens (9) pour alimenter les objets à étiqueter aux moyens de support (4) et des moyens (10) pour prélever les objets étiquetés desdits moyens de support (4) ; et
 au moins un dispositif d'étiquetage (14) positionné radialement le long du bord du carrousel (3) pour appliquer des étiquettes sur les objets, se trouvant sur les moyens de support (4), qui passent à son niveau pendant la rotation du carrousel (3) ; le dispositif d'étiquetage (14) étant associé de façon amovible au châssis (2) de manière à ce qu'il puisse être librement positionné dans diverses positions angulaires par rapport à l'axe de rotation (X) du carrousel (3) ;
 des moyens d'actionnement (17) pour le dispositif d'étiquetage (14) ; et
 au moins une unité de commande qui est opérationnellement reliée au moins aux moyens de déplacement (5) et aux moyens d'actionnement (17) pour en commander le fonctionnement de façon synchronisée ;
 la méthode étant **caractérisée en ce qu'elle** comprend les phases opérationnelles suivantes :

programmer l'unité de commande avec un programme qui est exprimé en fonction d'une ou de plusieurs variables représentant chacune la position angulaire d'un dispositif d'étiquetage mobile (14) par rapport à l'axe de rotation (X) et à un point de référence fixe ;
 au moins après chaque déplacement d'un dispositif d'étiquetage (14) par rapport au carrousel (3), détecter et mémoriser, en tant que position détectée, la position angulaire du dispositif d'étiquetage (14) par rapport

au point de référence fixe ;
entrer la position détectée dans le programme en tant que valeur à affecter à la variable correspondante ; et
utiliser la machine avec le programme obtenu de cette façon. 5

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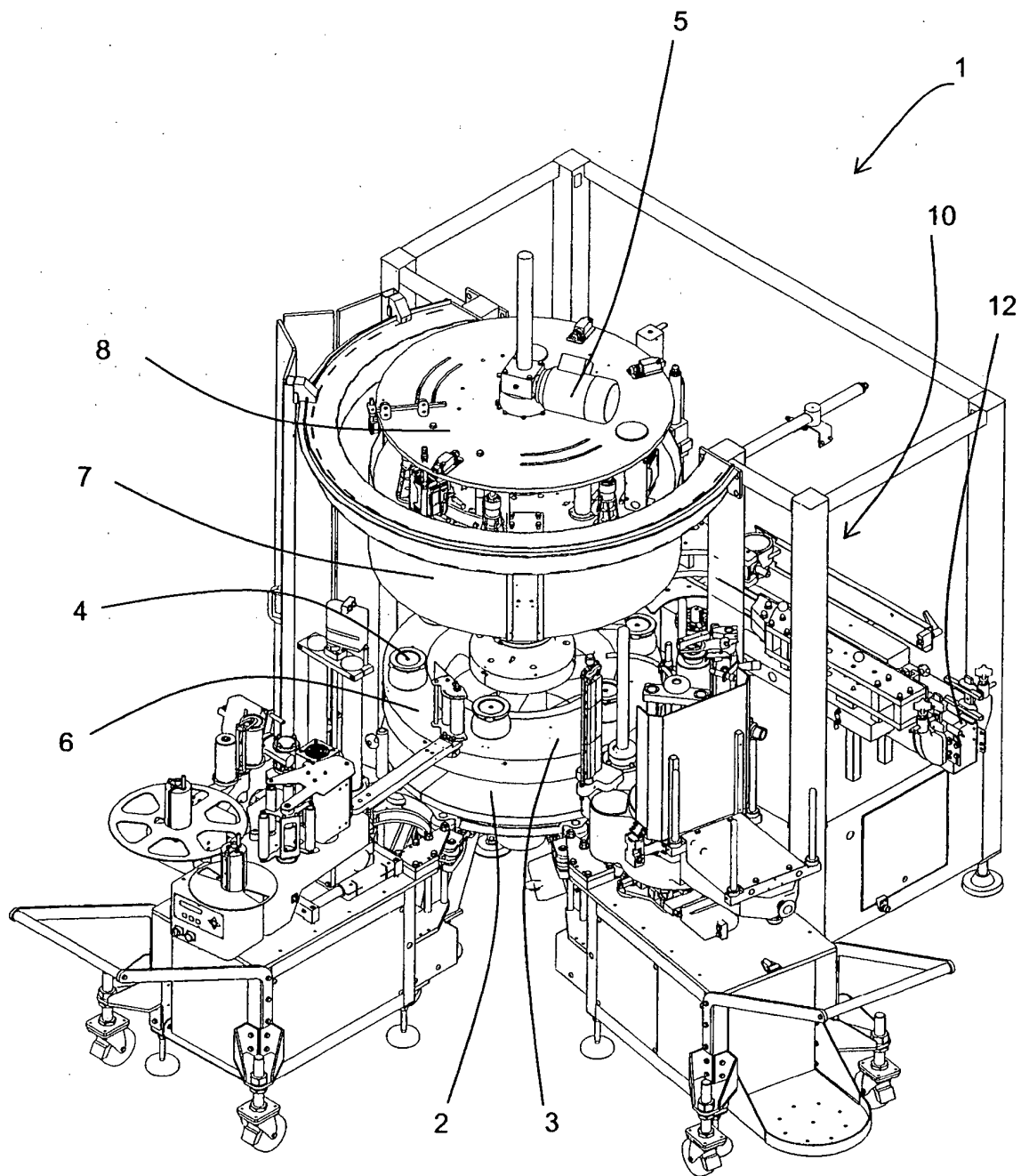


FIG. 1

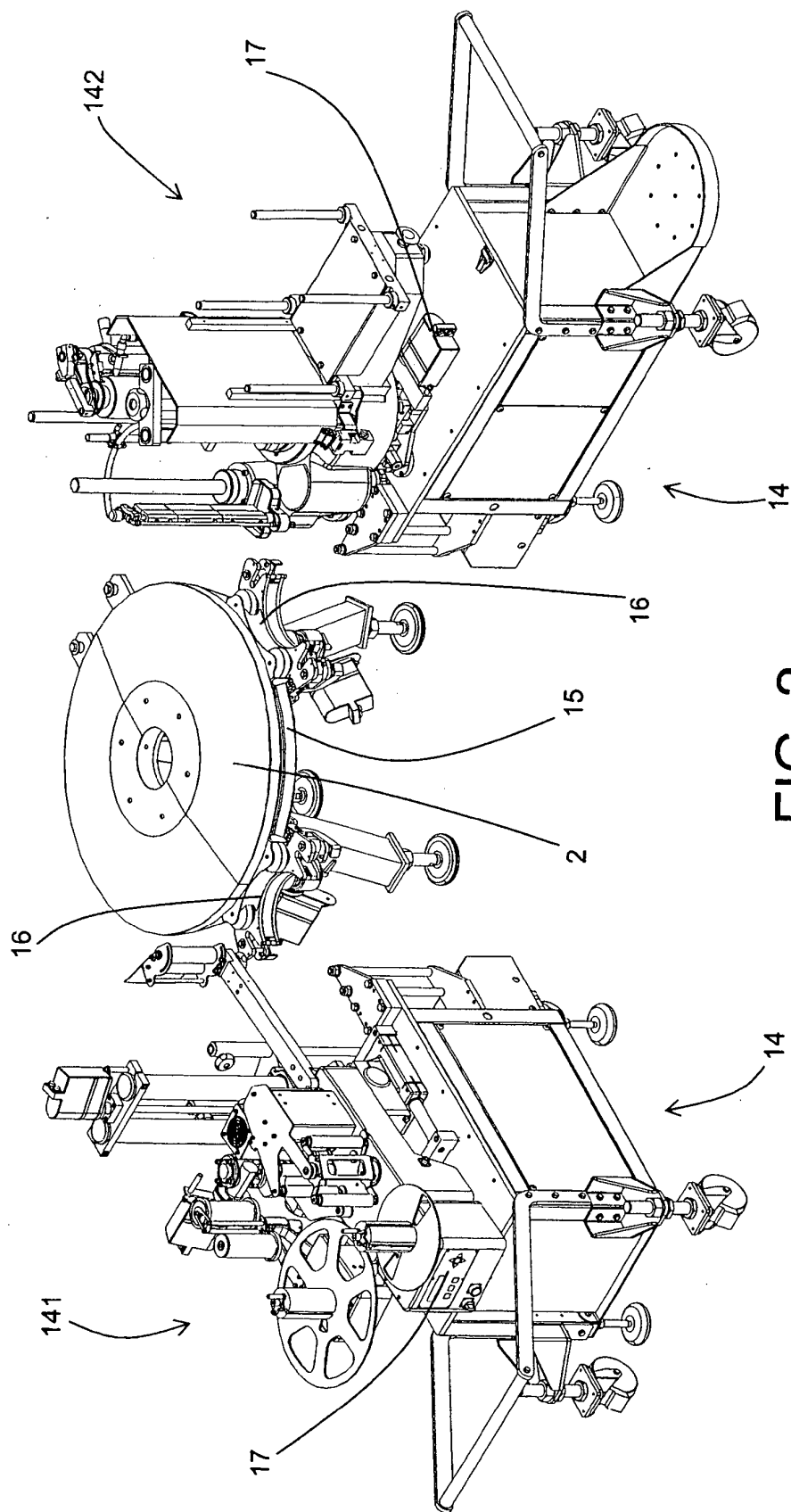
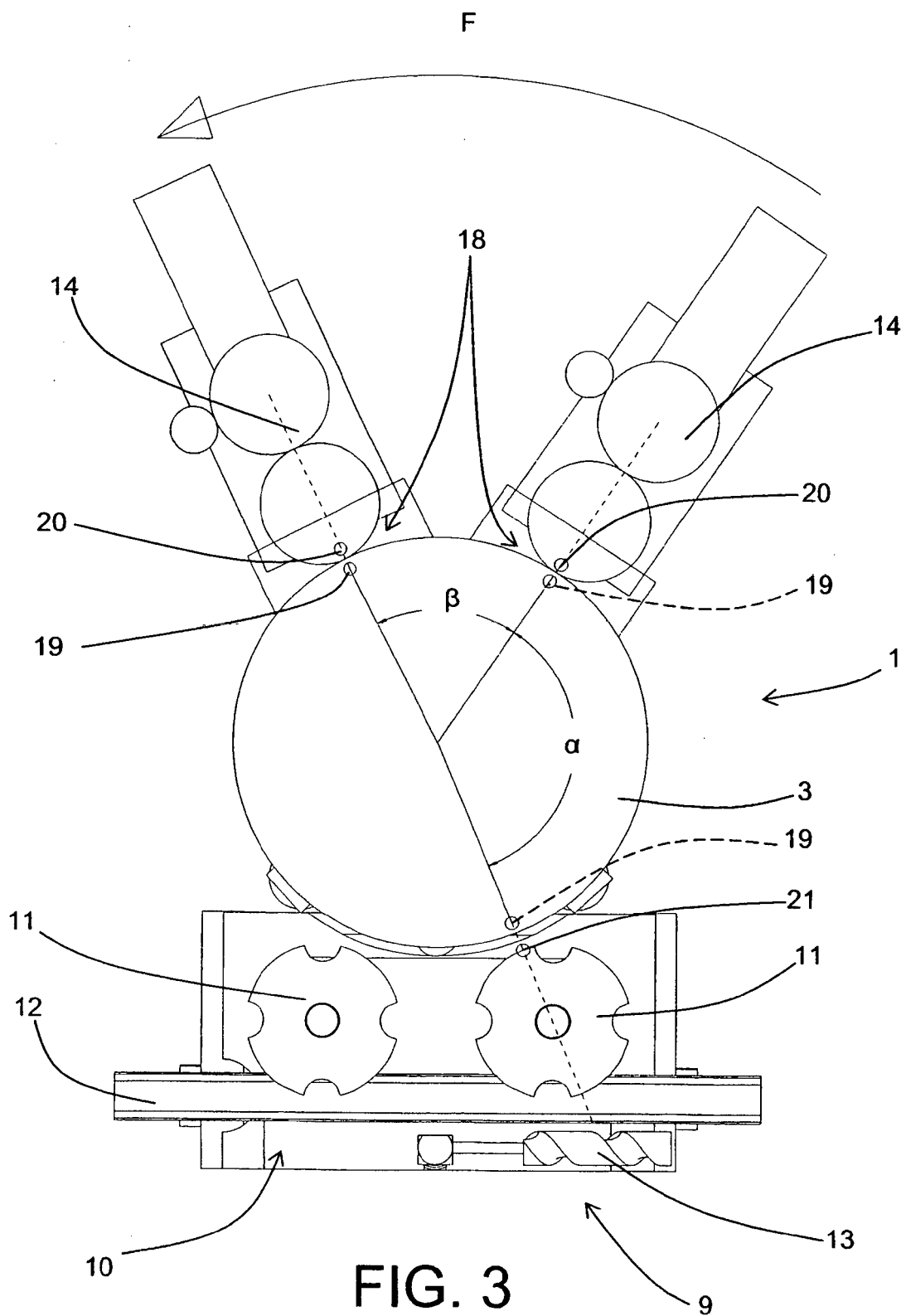


FIG. 2



REFERENCES CITED IN THE DESCRIPTION

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