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(54) **LABEL TRANSFER DRUM WITH SINGLE-PIECE PAD DEVICES FOR LABELLING
CONTAINERS BY MEANS OF PARTIAL LABELS**

(57) There is described a label transfer drum (13) for a labelling machine (1) configured to label containers (2), the transfer drum (13) is rotatable about a central rotation axis (X) and comprises a plurality of retaining sectors (15) each configured for receiving a respective label (3), for transporting such label (3) and for applying it on a respective container (2) at an application station (A), each retaining sector (15) comprises a leading pad member (16) for receiving and retaining a leading label end (3a)

and a trailing pad member (17) for receiving and retaining a trailing label end (3b), each leading pad member (16) and trailing pad member (17) is configured to be radially moved between a radially extracted position and a radially retracted position; for each retaining sector (15), the leading pad member (16) and the trailing pad member (17) are integrally constrained to one another in the radial movement between the extracted position and the retracted position.

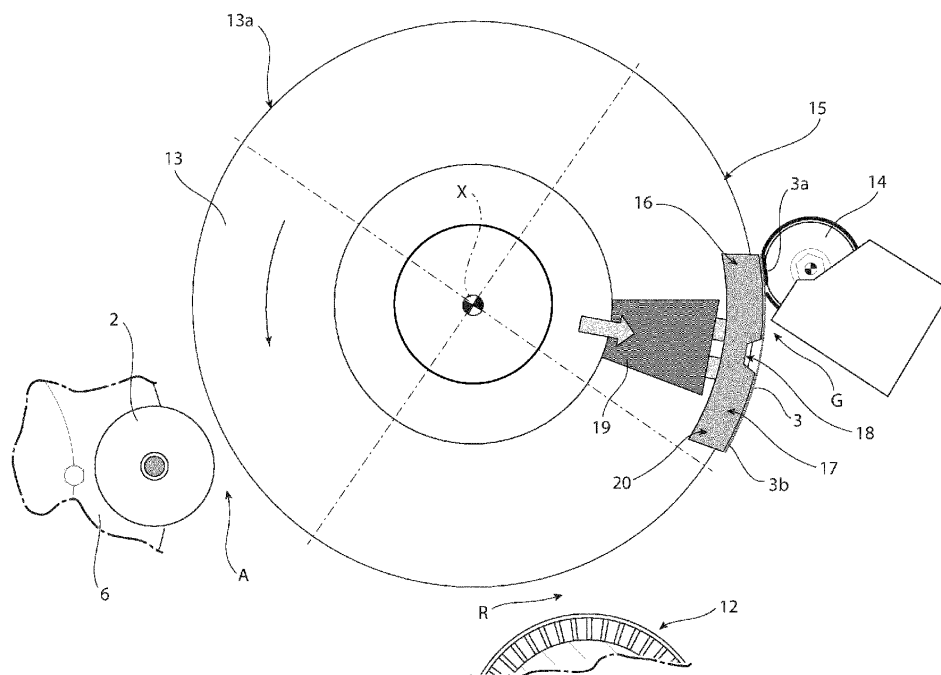


FIG. 2

Description

TECHNICAL FIELD

[0001] The present invention relates to a label transfer drum for a labelling machine for labelling containers adapted to contain a pourable product, preferably a pourable food product, by means of partial labels.

BACKGROUND ART

[0002] Labelling machines are known, which are commonly used to prepare, transport and apply labels onto containers, such as bottles, flacons or the like, destined to be filled with a pourable product, in particular a pourable food product.

[0003] Particularly widespread is the use of glued labels, i.e. portions of a labelling material that are cut at appropriate lengths from a web of labelling material initially wound in form of continuous strip around one or more storage reels and then sprinkled with glue.

[0004] In detail, the web of labelling material is progressively unwound off the relative reel and then repeatedly cut to obtain successive labels of equal length, upon which glue is applied by gluing means, such as a gluing roller, spray or injector systems or the like.

[0005] Eventually, the labels so obtained are conveyed and applied onto the respective containers to be labelled.

[0006] Particularly widespread are also labels of the tubular kind, known as "sleeve labels" and obtained starting from a web of heat-shrinking film wound in form of a continuous strip around one or more storage reels; the sleeve labels are applied with a certain clearance on the respective containers and then heated in an oven to obtain their shrinking and perfect adhesion to the lateral surfaces of the containers themselves. Sleeve labels do not require the use of glue.

[0007] Regardless of the type of label used, a known labelling machine typically comprises:

- a carousel rotatable around a vertical axis and configured to convey a plurality of containers along a horizontal, arc-shaped labelling path; and
- a labelling module, peripherally arranged relatively to the carousel and configured to prepare, transport and feed a plurality of labels to the carousel at an application station, in order to apply such labels to respective containers.

[0008] According to a well-known configuration, the labelling module typically comprises:

- one or more storage units, for example reels or spools around which the web of labelling material is initially wound in form of a continuous strip;
- a feed roller for unwinding the web off the relative reel and advance it along a feed path;
- a plurality of unwinding rollers, which feed and sup-

port, in use, the web progressively unwound from the respective reel and guide it, in use, along a feed path;

- a cutting unit for repeatedly cut the web at a cutting station so as to separate a sequence of labels from the web itself; and
- a label transfer device configured to receive, retain and advance each label and to feed each label to the carousel, at the application station.

[0009] Typically, the transfer device is defined by a vacuum drum rotatable about a central axis (typically vertical) and configured to receive the previously cut labels, to retain them by means of suction and, after a rotation of a determined angle about its axis, to release these labels to the application station, so that they are applied onto the respective containers advanced by the carousel.

[0010] Furthermore, in case glued labels are used, the labelling module comprises at least one gluing roller arranged substantially tangent to the vacuum drum, at a gluing station operatively downstream of the cutting unit and upstream of the application station, with respect to the direction of rotation of the vacuum drum, for spreading glue onto the leading and trailing ends of each single label, prior to their application onto the respective containers.

[0011] As it is known, the vacuum drum suction is exerted on the labels through a series of ports or holes obtained on an outer lateral surface of the vacuum drum itself.

[0012] In detail, the vacuum drum comprises a plurality of "divisions" or retaining sectors, each configured to cyclically receive and retain one label at a time.

[0013] Each retaining sector essentially comprises:

- a pair of pads, i.e. a leading pad or front pad, for supporting and retaining a leading end of the label, and a trailing pad or rear pad, for supporting and retaining a trailing end of the label; and
- an interpad section which is angularly interposed between the two pads.

[0014] In practice, when a label is retained by the vacuum drum it will typically have the leading end arranged on the leading pad, the trailing end arranged on the trailing pad and the remaining intermediate part arranged on the corresponding interpad section.

[0015] Each one of the pads and the interpad section presents a plurality of the aforementioned holes on an outer surface thereof.

[0016] It is known in the field that the interaction between a respective pair of pads and the gluing roller (i.e. the contact between the label retained by such pair of pads and the gluing roller) must be established only when a label is actually retained by such pair of pads. Otherwise, an undesired spreading of glue on the pads may occur.

[0017] To avoid such an occurrence, a first solution

entails the presence of a movable gluing roller. In particular, the gluing roller is movable between an active position, in which its outer lateral surface is substantially tangent to the pitch diameter of the transfer drum, such pitch diameter being defined by the set of the radial outer lateral surfaces of the pads, and an inactive position, in which the gluing roller is at a non-zero distance from the pitch diameter of the transfer drum.

[0018] In the active position the sequential gluing of the labels takes place, whereas when the gluing roller is controlled in the inactive position the relative pairs of pads pass through the gluing station without cooperating with the gluing roller.

[0019] For example, the gluing roller may be controlled in the inactive position in case no label is received by a given retaining sector, so that the corresponding pair of pads (devoid of label) is not spread with glue.

[0020] Such first solution is particularly suitable for low-speed applications.

[0021] A second solution, which is more suitable for high-speed applications, entails a fixed gluing roller and movable pads.

[0022] In detail, the pads are radially movable, independently from one another, between an extracted position and a retracted position.

[0023] In greater detail, each pad is equipped with a respective dedicated actuator configured for driving the radial movement of the pad between the extracted position and the retracted position.

[0024] For example, a pad may be controlled in the retracted position, in case no label is received thereon, when passing through the gluing station, so that such pad (devoid of label) is not spread with glue.

[0025] Although being structurally and functionally valid, the Applicant has observed that the label transfer drums of the aforementioned type are still open for further improvement, in particular as per the application of so-called "partial labels", i.e. labels which have a longitudinal extension so as to cover an angular portion on the outer surface of the respective containers measuring less than 360°, for example between 180° and 360°, namely labels which extension does not suffice to wrap completely around the outer lateral surface of the containers, namely labels the longitudinal extension of which is smaller than the total angular extension of the outer lateral surface of the containers, in high-speed conditions.

[0026] In fact, the partial labels are usually defined by rather short strips of labelling material. The shorter the labels, the closer the pads of each pair of pads (i.e. of each retaining sector) must be. However, if the distance between the pads of the same pair is too short, the space for arranging the actuators is reduced. Moreover, the time available for the transient movement of each pad between the extracted position and the retracted position is also reduced.

DISCLOSURE OF INVENTION

[0027] It is therefore an object of the present invention to provide a label transfer drum which is designed to overcome at least one of the above-mentioned drawbacks in a straightforward and low-cost manner.

[0028] This object is achieved by a label transfer drum as claimed in the appended independent claim 1. Preferred embodiments of the present invention are laid down in the appended dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a schematic top view, with parts removed for clarity, of a labelling machine comprising a label transfer drum according to the present invention; Figures 2 and 3 are larger-scale, schematic top views, with parts removed for clarity, of the label transfer drum of Figure 1 during two distinct operative conditions.

BEST MODE FOR CARRYING OUT THE INVENTION

[0030] With reference to Figure 1, number 1 indicates as a whole a labelling machine configured for labelling containers 2 such as bottles, flacons or the like, adapted to contain a pourable product, preferably a pourable food product (such as water, soft drinks, beer, wine, juice, milk, or the like).

[0031] In particular, machine 1 is configured for labelling containers 2 by means of labels 3 obtained from a web 4 of labelling material.

[0032] According to this preferred and non-limiting embodiment, labels 3 are defined by glued labels, i.e. strips of labelling material that are cut at predetermined lengths from web 4 and then sprinkled with glue before their application on the respective containers 2.

[0033] Web 4 is provided in the form of a continuous strip initially wound in a reel 5 and is progressively unwound, in use, off reel 5, according to a known manner.

[0034] As visible in Figure 1, labelling machine 1 comprises:

- a carousel 6 rotatable about a central axis Z, preferably vertical, and configured to advance a plurality of containers 2 along an arc-shaped labelling path, preferably horizontal, around axis Z; and
- a labelling module 7 (only schematically shown), arranged peripherally to carousel 6 and configured for preparing a plurality of labels 3 starting from web 4 and feeding such labels 3 to carousel 6 at an application station A, so as to apply them onto respective containers 2.

[0035] Labelling module 7 is substantially of the known type and comprises:

- a support member, preferably in the form of at least one support shaft 8, for supporting one reel 5 at a time in an unwindable manner;
- a feed roller 10 mounted in a rotatable manner to module 7, actuatable in rotation for feeding web 4 along a feed path P which extends within and through labelling module 7, and conveniently arranged downstream of support shaft 8 along feed path P;
- a plurality of guide rollers 11 (only one shown), arranged downstream of support member 8, and configured to support the web 4 progressively unwound from reel 5 and to guide web 4 along feed path P;
- a cutting unit 12 (known per se and not described in detail) arranged downstream of guide rollers 11, along feed path P, and configured to repeatedly cut web 4 thereby obtaining a sequence of labels 3 therefrom;
- a label transfer drum 13 arranged downstream of cutting unit 12, and mounted on module 7 in a rotatable manner about a central rotation axis X which is preferably parallel to axis Z; and
- a gluing roller 14 arranged peripherally (and substantially tangent) to drum 13, at a gluing station G, and configured for spreading glue on each individual label 3, before the application thereof on the respective containers 2.

[0036] In detail, glue roller 14 is configured to sequentially spread glue on a leading end 3a and on a trailing end 3b of each label 3 carried by drum 13.

[0037] Conveniently, drum 13 is a vacuum drum of the known type.

[0038] Preferably, drum 13 has a substantially cylindrical or toroidal-lobed configuration.

[0039] Furthermore, drum 13 has an outer lateral surface 13a, which extends angularly about axis X, and is configured to receive the labels 3 previously cut by cutting unit 12 at a receiving station R, to retain such labels 3, and to transfer labels 3 to application station A by means of a rotation about axis X, for the application thereof onto respective containers 2.

[0040] In light of the above:

- cutting unit 12 is arranged peripherally to drum 13;
- gluing station G is operatively upstream of application station A and operatively downstream of receiving station R, with respect to the direction of rotation (counterclockwise in figure 1) of drum 13 about axis X.

[0041] Drum 13 comprises a plurality of retaining sectors 15 located on outer lateral surface 13a and each configured to cyclically receive and retain a label, by means of suction.

[0042] In the preferred embodiment shown, drum 13 comprises four retaining sectors 15 distributed around axis X.

[0043] Each retaining sector 15 is configured to cyclically receive one label 3 at a time at receiving station R, to retain said label 3 by suction, and to release said label 3, at application station A, to a respective container 2 to be labelled.

[0044] In other words, each retaining sector 15 is configured for receiving a respective label 3 at receiving station R, for transporting such label 3 angularly around axis X by means of the rotation of drum 13, and for applying label 3 on a respective container 2 at application station A.

[0045] To this end, retaining sectors 15 are provided with vacuum ports or slots or holes (not shown) as described in the introductory portion of the present description.

[0046] Surface 13a is defined by the assembly of the radial outer lateral surfaces of all retaining sectors 15 present in drum 13.

[0047] Moreover, each retaining sector 15 is configured to convey the respective label 3 through gluing station G, at which the ends 3a, 3b of such label 3 are sprinkled with glue by gluing roller 14.

[0048] Each retaining sector 15 comprises:

- a leading pad member 16 for receiving and retaining the leading end 3a of a respective label 3;
- a trailing pad member 17 for receiving and retaining the trailing end 3b of a respective label 3;
- an interpad section 18 which is angularly interposed between the leading pad member 16 and the trailing pad member 17.

[0049] In practice, when a label 3 is retained by drum 13 it will have the leading end 3a arranged on the leading pad member 16, the trailing end 3b arranged on the trailing pad member 17 and the remaining intermediate part arranged on the corresponding interpad section 18.

[0050] Each of the pads and the interpad section conveniently presents a plurality of the aforementioned holes on an outer surface thereof.

[0051] As it is known, the interaction between pad members 16, 17 and gluing roller 14 (i.e. the contact between the label 3 retained by such pad members 16, 17 and gluing roller 14) must be established only when a label 3 is actually retained thereon. Otherwise, an undesired spreading of glue on the pad members 16, 17 may occur.

[0052] To this end, each leading pad member 16 and trailing pad member 17 is conveniently configured to be radially moved, with respect to axis X, between a radially extracted position (Figure 2), in which it is configured to interact with gluing roller 14 for the application of glue, and a radially retracted position (Figure 3), in which it is spaced from the gluing roller 14 for avoiding the application of glue.

[0053] In detail, when pad members 16, 17 are controlled in the extracted position, the label 3 retained thereon is spread with glue upon passing through gluing station G. Conversely, when pad members 16, 17 are controlled in the retracted position, they remain radially spaced from gluing roller upon passing through gluing station G and do not interact with gluing roller 14.

[0054] For example, pad members 16, 17 may be controlled in the retracted position in case no label 3 is received thereon at receiving station R, or during the starting transient of machine 1 during which no web 4 is yet fed along feed path P, so that such pad members 16, 17 (devoid of label) are not spread with glue.

[0055] This configuration allows to avoid a complicated mechanism for controlling a movement of gluing roller 14, which therefore is fixed with respect to drum 13.

[0056] According to an aspect of the present invention, for each retaining sector 15, the leading pad member 16 and the trailing pad member 17 are integrally constrained to one another in the radial movement between the extracted position and the retracted position.

[0057] Advantageously, also the interpad section 18 is integrally constrained to the respective leading pad member 16 and trailing pad member 17 in the radial movement between the extracted position and the retracted position.

[0058] In particular, each retaining sector 15 includes a single respective actuator device 19 coupled with the respective leading pad member 16 and trailing pad member 17 and configured for simultaneously driving the radial movement thereof between the extracted position and the retracted position.

[0059] Hence, according to the invention, single actuator device 19 simultaneously drives both pad members 16, 17 at the same time.

[0060] According to a preferred embodiment of the present invention, each retaining sector 15 comprises:

- a single pad device 20 which includes a front pad portion, defined by the aforementioned leading pad member 16, and a rear pad portion, defined by the aforementioned trailing pad member 17, and which is movable between the aforementioned extracted position and retracted position; and
- one single actuator device 19 coupled with pad device 20 and configured for driving a radial movement of pad device 20, with respect to axis X, between the extracted position and the retracted position.

[0061] More specifically, each pad device 20 is movable between the aforesaid extracted position, in which it is configured to interact with gluing roller 14 for the application of glue, and the aforesaid retracted position, in which it is spaced from gluing roller 14 for avoiding the application of glue, by means of the respective single actuator device 19.

[0062] Accordingly, for each retaining sector 15, front

pad portion 16 and rear pad portion 17 are configured to be radially moved between the extracted position and the retracted position by the respective single actuator device 19 in a simultaneous manner.

[0063] In light of the above, each pad device 20 includes, and hence carries, front pad portion 16 and rear pad portion 17, which are therefore integral in movement with one another.

[0064] Figure 2 shows an operative condition of drum 13 whereby a pad device 20 retaining a label 3 is controlled, by the respective single actuator device 19, in its extracted position. In such a condition, when pad device 20 transits through gluing station G, front pad portion 16 and rear pad portion 17 interact with gluing roller 14, thereby causing the application of glue onto leading end 3a and trailing end 3b, respectively. Hence, Figure 2 corresponds to a normal operative condition of the labelling process.

[0065] Figure 3 shows a distinct operative condition of drum 13 whereby a pad device 20 which does not retain a label 3 (for example because no label 3 was fed thereto at receiving station R or there is a gap in the flow of containers being conveyed and to be labelled) is controlled, by the respective single actuator device 19, in its retracted position. In such a condition, when pad device 20 transits through gluing station G, front pad portion 16 and rear pad portion 17 remain spaced from gluing roller 14 by a non-zero distance, thereby preventing the glue to undesirably contaminate pad device 20.

[0066] In particular, when controlled in the radially retracted position, each pad device 20 is in a position radially more internal than the pitch diameter of drum 13.

[0067] In light of the above, an active configuration and an inactive configuration of retaining sector 15 may be defined, whereby the active configuration is defined by the pad device 20 in the extracted position and the inactive configuration is defined by the pad device 20 in the retracted position.

[0068] Expediently, each pad device 20 is made in one single piece without solution of continuity.

[0069] In detail, for each retaining sector 15, front pad portion 16 and rear pad portion 17 are made in one single piece without solution of continuity.

[0070] Thanks to the fact that each retaining sector 15 includes a front pad portion 16 (i.e. a leading pad member) and a rear pad portion 17 (i.e. a trailing pad member) which are embedded in a single pad device 20 made in one single piece, the switching between the extracted position and the retracted position can be effectively established also when labels 3 which have a relatively short longitudinal extension are used, such as so-called partial labels.

[0071] In particular, drum 13 according to the invention is particularly advantageous for the use with partial labels, i.e. labels the longitudinal extension of which is smaller than the total angular extension of the outer lateral surface of the respective container 2, or labels which, once completely applied on the respective con-

tainer 2 or at the end of the labelling process, covers an angular sector of the outer lateral surface of the container 2 the angular extension of which is smaller than 360°, for example between 180° and 360°, or less than 180°, or less than 90°, for example 30°.

[0072] In fact, the use of a single actuator device 19 to drive a single pad device 20 including a front pad portion 16 and a single pad portion 17 allows for a shorter (angular) distance between such front pad portion 16 and single pad portion 17, since such single pad-single actuator configuration according to the present invention eliminates the problem of possible mechanical interference between dedicated actuators for each pad portion, which are instead used in the known system whereby pad members are movable independently from one another.

[0073] Moreover, the problem of the transient time necessary for the control of each pad portion/pad member between the extracted and retracted position, especially during high-speed operative condition, is reduced.

[0074] The above ultimately results in an improved switching between the active and inactive configurations of each retaining sector 15.

[0075] As visible in the appended figures, each pad device 20 further includes an interpad portion, which is defined by the aforementioned interpad section 18, and which is thus angularly interposed between front pad portion 16 and rear pad portion 17.

[0076] Accordingly, for each retaining sector 15, interpad portion 18 is integral with front pad portion 16 and rear pad portion 17 in the radial movement of pad device 20 between the extracted position and the retracted position and is made in one single piece without solution of continuity with front pad portion 16 and rear pad portion 17.

[0077] This configuration allows for a reduced number of components of drum 13, eases the maintenance operations on drum 13 and improves the management of the radial movement of pad devices 20 at high-speed conditions.

[0078] Preferably, actuator device 19 comprises a pneumatic actuator, or an electric motor, or an electromagnetic motor, or a hydraulic actuator.

[0079] These configurations allow for a precise movement control, with reduced wear, which is particularly advantageous at high operational speeds.

[0080] Alternatively, actuator device 19 may comprise:

- a cam member (not shown) fixed with respect to axis X; and
- a plurality of cam follower rollers, each integral with, and carried by, one respective pad device 20 and configured for interacting with the cam member for producing the radial movement of such respective pad device 20.

[0081] This configuration allows for a simple and cost-effective system for driving the radial movement.

[0082] The advantages of drum 13 according to the

present invention will be clear from the foregoing description.

[0083] In particular, the single pad device-single actuator device configuration of each retaining sector 15 of the drum 13 according to the invention improves the management of labels of the short type, such as aforementioned partial labels, especially at high-speed applications.

[0084] In fact, due to the presence of a single actuator device and to the fact that the leading pad member/front pad portion and the trailing pad member/rear pad portion are integral to one another in the radial movement, the distance between these two can be reduced, thereby allowing for the use of shorter labels (such as partial labels) in a simple and cost-effective manner.

[0085] Therefore, labelling machine 1 may easily operate with partial labels and at high operative speeds.

[0086] Clearly, changes may be made to label transfer drum 13 as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

Claims

1. Label transfer drum (13) for a labelling machine (1) configured to label containers (2) adapted to contain a pourable product, the transfer drum (13) being rotatable about a central rotation axis (X) and comprising a plurality of retaining sectors (15) located on an outer lateral surface (13a) thereof and each configured for receiving a respective label (3) at a receiving station (R), for transporting such label (3) by means of the rotation of the transfer drum (13) to an application station (A), and for applying the respective label (3) on a respective container (2) at the application station (A),

each retaining sector (15) comprising a leading pad member (16) for receiving and retaining a leading label end (3a) and a trailing pad member (17) for receiving and retaining a trailing label end (3b),

wherein each leading pad member (16) and trailing pad member (17) is configured to be radially moved, with respect to the central axis (X) between a radially extracted position, in which it is configured to interact with a gluing roller (14) for the application of glue, and a radially retracted position, in which it is spaced from the gluing roller (14) for avoiding the application of glue;

and wherein, for each retaining sector (15), the leading pad member (16) and the trailing pad member (17) are integrally constrained to one another in the radial movement between the extracted position and the retracted position.

2. Label transfer drum as claimed in claim 1, wherein each retaining sector (15) extends angularly around the central axis (X) and further comprises an interpad member (18) which is angularly interposed between the respective leading pad member (16) and trailing pad member (17);
and wherein, for each retaining sector (15), the interpad member (18) is integrally constrained to the respective leading pad member (16) and trailing pad member (17) in the radial movement between the extracted position and the retracted position.
3. Label transfer drum as claimed in claim 1 or 2, wherein each retaining sector (15) includes a single actuator device (19) coupled with the respective leading pad member (16) and trailing pad member (17) and configured for simultaneously driving the radial movement thereof between the extracted position and the retracted position.
4. Label transfer drum as claimed in claim 1, wherein each retaining sector (15) comprises:
 - a single pad device (20) which includes a front pad portion (16), defined by said leading pad member, and a rear pad portion (17), defined by said trailing pad member, the single pad device (20) being movable between said extracted position and retracted position; and
 - a single actuator device (19) coupled with the pad device (20) and configured for driving a radial movement of the pad device (20), with respect to the central axis (X), between the extracted position and the retracted position.
5. Label transfer drum as claimed in claim 4, wherein each pad device (20) is movable between the extracted position and the retracted position by means of the respective single actuator (19).
6. Label transfer drum as claimed in claim 4 or 5, wherein the front pad portion (16) and the rear pad portion (17) are configured to be radially moved between the extracted position and the retracted position by said single actuator device (19) in a simultaneous manner.
7. Label transfer drum as claimed in claim 6, wherein said pad device (20) defines a portion of said outer lateral surface (13a) of the transfer drum (13) angularly extending around the central axis (X);

 wherein said pad device (20) further includes an interpad portion (18) angularly interposed between the front pad portion (16) and the rear pad portion (17);
 and wherein the interpad portion (18) is integral with the front pad portion (16) and the rear pad portion (17) in the radial movement of the pad device (20) between the extracted position and the retracted position.
8. Label transfer drum as claimed in any one of claims 4 to 7, wherein, for each retaining sector (15), the front pad portion (16) and the rear pad portion (17) are made in one single piece without solution of continuity.
9. Label transfer drum as claimed in claims 7 and 8, wherein, for each retaining sector (15), the interpad portion (18) is made in one single piece without solution of continuity with the front pad portion (16) and the rear pad portion (17).
10. Label transfer drum as claimed in any one of claims 4 to 9, wherein said single actuator device (19) comprises a pneumatic actuator, or an electric motor, or an electromagnetic motor, or a hydraulic actuator, or a cam member fixed with respect to the central axis (X) and a cam follower integral with the single pad device (20) and configured to interact with the cam member for producing said radial movement.
11. Label transfer drum as claimed in any one of the foregoing claims, wherein the transfer drum (13) is configured for receiving, transporting and applying partial labels, each partial label being a label (3) the longitudinal extension of which is smaller than the total angular extension of the outer lateral surface of the respective container (2), or a label (3) which, once completely applied on the respective container (2) or at the end of the labelling process, covers an angular sector of the outer lateral surface of the container (2) the angular extension of which is smaller than 360°, or smaller than 90°, or smaller than 180°.
12. Labelling machine (1) for labelling containers (2) adapted to contain a pourable product, the labelling machine (1) comprising:
 - a conveyor (6) configured for advancing a plurality of containers (2) to be labelled;
 - a feed roller (10) configured for feeding a web (4) of labelling material;
 - a cutting unit (12) configured for repeatedly cutting the web (4) thereby separating a sequence of labels (3) therefrom; and
 - a label transfer drum (13) as claimed in any one of the foregoing claims, the transfer drum (13) being rotatable about the central axis (X) and being configured to sequentially receive the labels (3) and to transfer such labels (3) to an application station (A) for the application thereof onto respective containers (2).

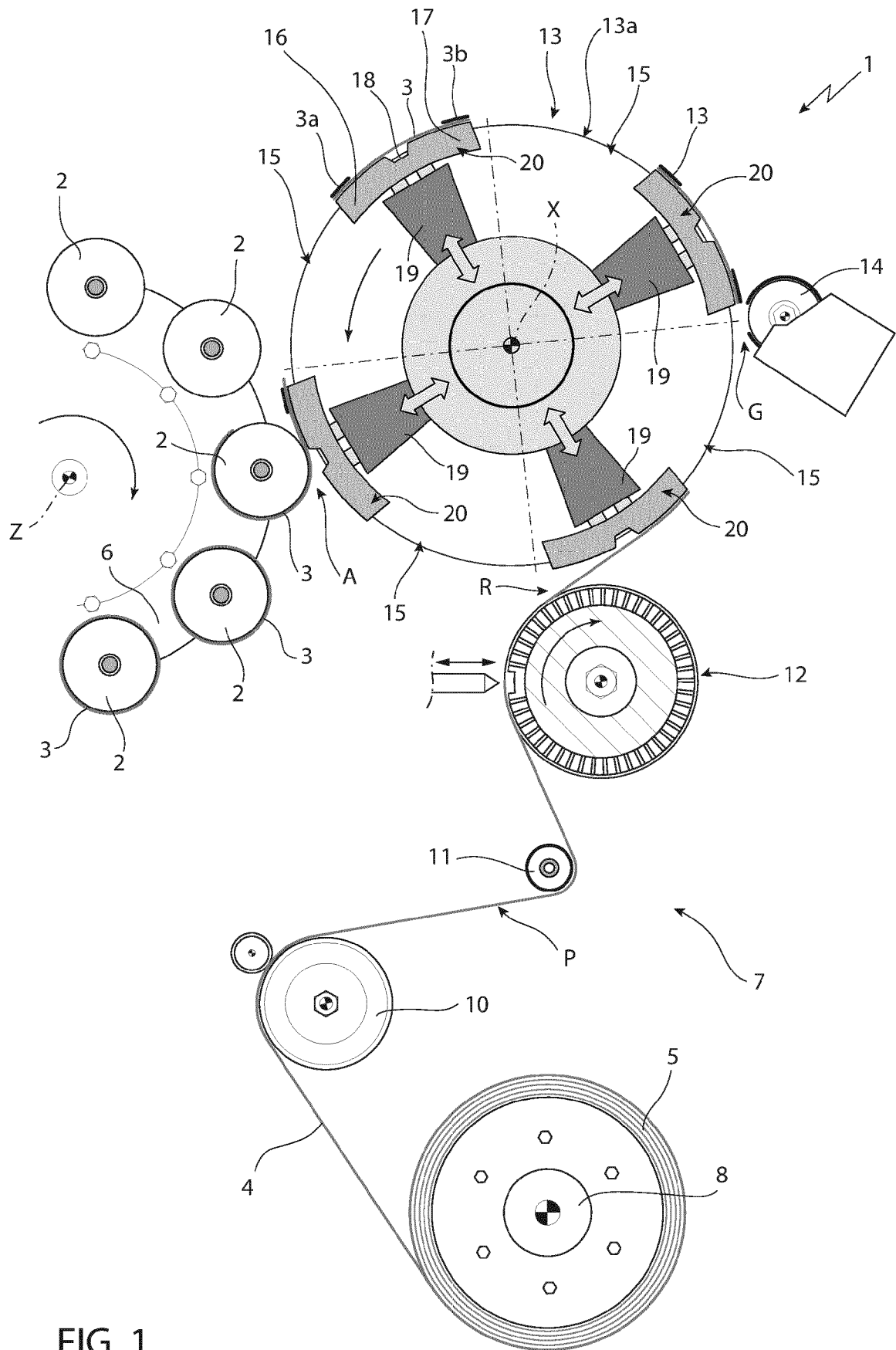


FIG. 1

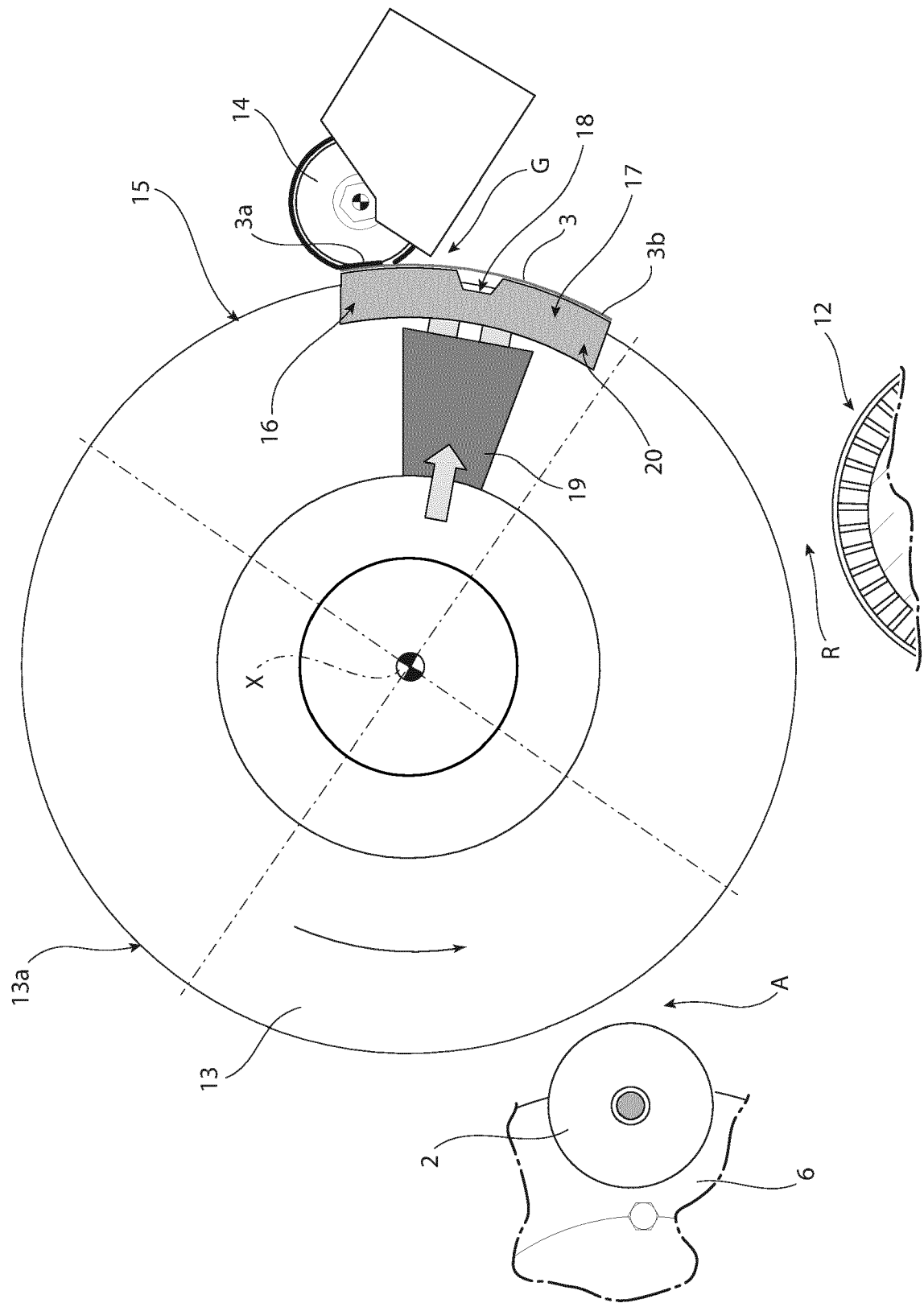


FIG. 2

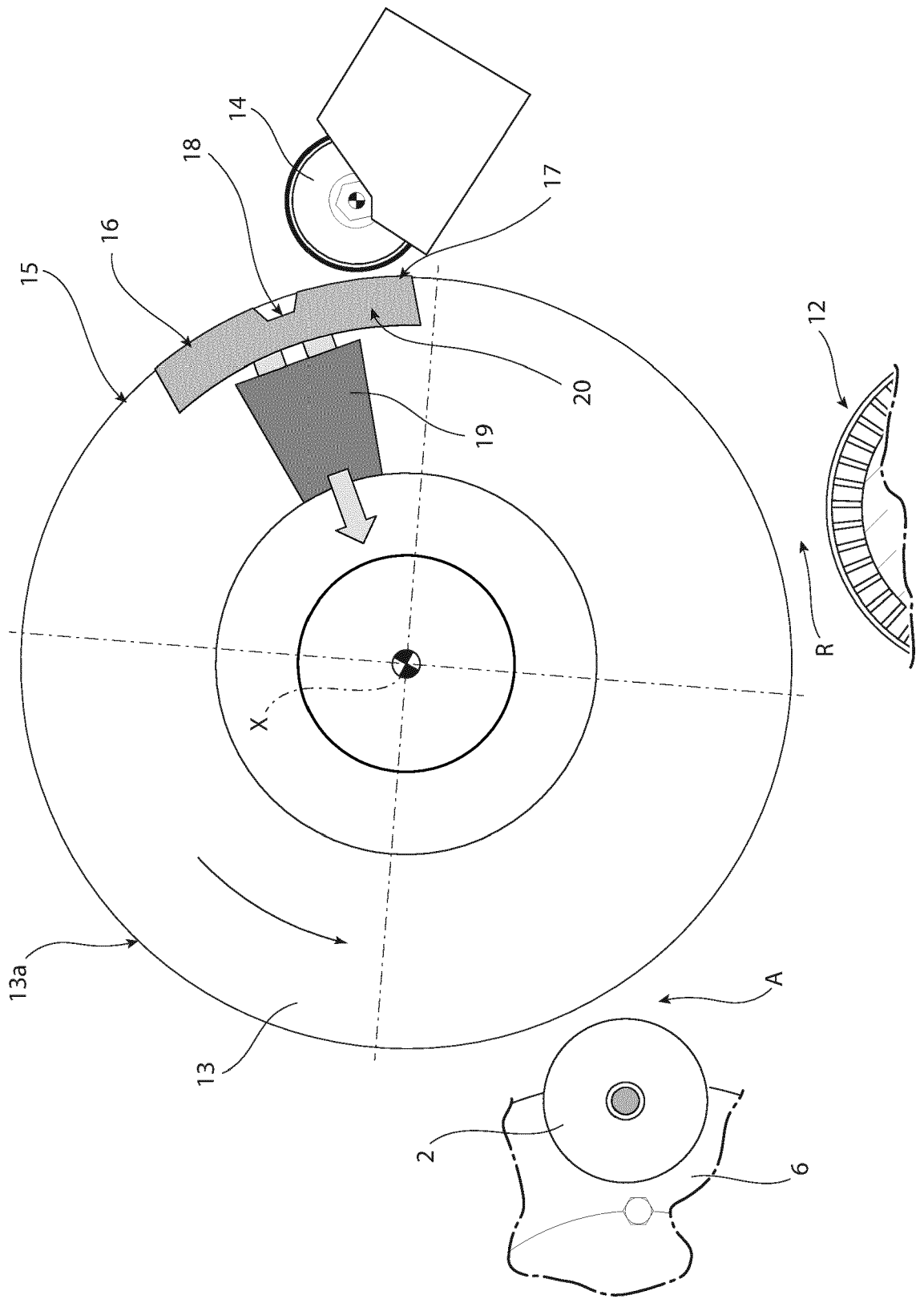


FIG. 3



EUROPEAN SEARCH REPORT

Application Number

EP 23 19 5866

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 68 04 629 U (KRONSEDER HERMANN [DE]) 17 May 1973 (1973-05-17) * figures 1-6 * * page 8, paragraph 2 - page 9, last paragraph *	1-12	INV. B65C3/16 B65C9/18 B65C9/22
X	JP 2018 002236 A (SHIBUYA MACHINERY CO LTD) 11 January 2018 (2018-01-11) * paragraphs [0010] - [0027] * * figures 1-9 *	1-12	
X	WO 2021/144137 A1 (PE LABELLERS SPA [IT]) 22 July 2021 (2021-07-22) * figures 1-12 * * page 5, line 26 - page 13, line 23 *	1-12	
X	WO 2020/108845 A1 (KRONES AG [DE]) 4 June 2020 (2020-06-04) * figures 1-5 * * page 8, line 7 - page 14, last line *	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		15 February 2024	Pardo Torre, Ignacio
CATEGORY OF CITED DOCUMENTS			
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