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(71) Applicant: LANFRANCHI S.R.L. [IT/IT]; Via Scodoncello, 41/E, 43044 Collecchio (Parma) (IT).

(72) Inventor: LANFRANCHI, Mario; c/o Lanfranchi S.R.L., Via Scodoncello, 41/E, 43044 Collecchio (Parma) (IT).

(74) Agents: BENELLI, Cristian et al.; c/o Ing. Dallaglio S.R.L., Via Mazzini N. 2, 43121 Parma (IT).

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(54) Title: METHOD FOR MOVING CONTAINERS SELECTED OR ALIGNED IN AN ORIENTING MACHINE AND APPARATUS THUS ATTAINED

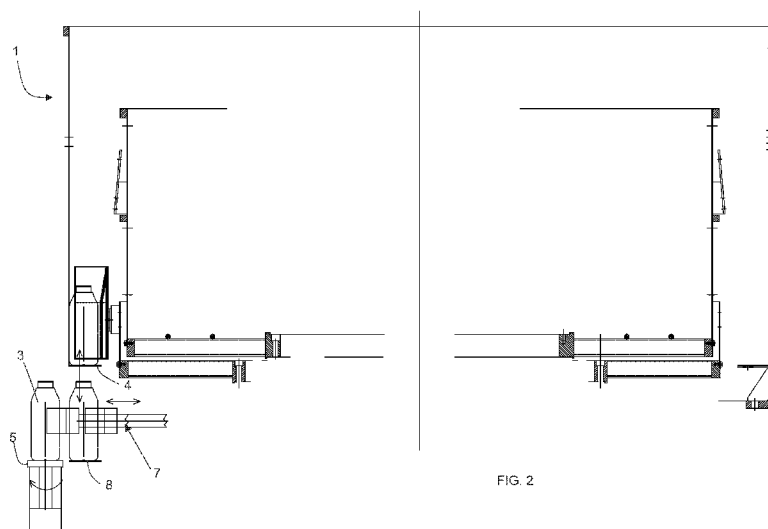


FIG. 2

(57) Abstract: Method and apparatus for the movement of containers aligned in an orienting machine, wherein inside said rotary machine, a plurality of bulk containers are selected and ordered and possibly aligned or straightened. Provision is made for: a. picking up, from said machine, the containers selected thereby and moving at least one part of these along a path outside the machine; said path being non-linear around the machine, b. following the advancement along said non-linear path, the container undergoes at least one further work step, wherein with work steps it is intended one or more, on their own or in combination, of the following : steps of filling, of labeling, of sealing, of capping, of orientation, of inspection, of analysis of the seal, and so forth.



TITLE: METHOD FOR MOVING CONTAINERS SELECTED OR
ALIGNED IN AN ORIENTING MACHINE AND APPARATUS THUS
ATTAINED

5

DESCRIPTION

FIELD OF APPLICATION OF THE INVENTION

The present finding is inserted in the field of orienting machines and of treatment lines downstream of such machines.

STATE OF THE ART

10 Orienting machines are known; examples thereof are found in the documents EP1590276, EP1601594, EP1209103, EP0877711, US4825995, US4825995.

It is also known to arrange a series of transfer means, usually of rotary star conveyor type, for the containers thus selected and
15 aligned by said orienting machines and in-line operating, with a series of stand-alone machines, further steps of filling, capping, labeling, inspection, and finally packaging.

EXPOSITION AND ADVANTAGES OF THE FINDING

Object of the present finding is to provide the art with a new
20 work method for the movement of the containers after the orienting machine.

Another object of the invention is to create a more compact work system, optimizing the bulk and also the costs of the transfer lines.

25 Said objects and advantages are all attained by the method

for moving containers selected or aligned in an orienting machine and apparatus thus attained, object of the present finding, which is characterized for that provided in the below-reported claims.

BRIEF DESCRIPTION OF THE FIGURES

5 This and other characteristics will be more evident from the following description of several embodiments illustrated, as a mere non-limiting example, in the enclosed drawing tables.

- Figure 1: an orienting machine for orienting containers (bottles, preform bottles) preferably made of plastic, with transfer
10 means and movement means associated therewith, with progression according to a non-linear i.e. non-rectilinear path;

- Figure 2: a second embodiment variant,

- Figure 3: a third embodiment variant,

- Figures 4, 5, 6, 7, 8, 9: possible configurations of the
15 apparatus with distributed, along the non-linear path, one or more work stations with which the container undergoes at least one or more work steps, on their own or in combination,

- Figure 10: a further variant with movement with catenary.

20 DESCRIPTION OF THE FINDING

With particular reference to figure 1, reference number 1 indicates an orienting machine of containers 3 (bottles, preform bottles) preferably made of plastic. Said orienting machine, as known, comprises means for selecting the containers, and
25 positioning them according to a suitable position. Generally, the

containers are selected laid-down via a series of means known with the technical term of lifting elements, then they are made to fall into cradles and separators 2 which provide for their straightening. In any case, the present finding already functions with the container
5 3 selected and in some manner arranged on the machine, ready to be extracted and moved according to a path better described hereinbelow.

In the case of complete straightening, usually the containers 3, when they vertically fall inside the machine, fall and are abutted
10 against a slide surface 4, and from here they are advanced e.g. on an annular path inside the orienting machine.

According to a first embodiment, provision is made for interrupting the slide surface 4.

Provision is made for the transfer on further means 5
15 provided with movement and progression such to move the container according to a non-linear path, i.e. non-rectilinear path.

The transfer occurs during the interruption.

After this, the slide surface returns inside the machine.

Said means 5 are generically plates, trays, or equivalent
20 systems.

The transferred container 3 is capable of remaining with the bottom 3a abutted against the plate 5.

The plurality of plates 5 for the movement and support of the container can be an integral part of the orienting machine, i.e. they
25 are situated outside E the fixed and cylindrical wall 6 of the latter.

In such case, the plates 5 are provided with the possibility to rotate according to a same axis AA corresponding to that of the orienting machine, so as to rotate concentric and outside E the fixed cylindrical wall 6.

5 Once the container 3 is brought outside the machine, the container is moved integral with the rotating parts of the machine.

Therefore, the containers 3 rotate in the same rotation sense as the orienting machine, i.e. of the carousels of the cradles and separators.

10 Only one plate is illustrated in figure 1 for the sake of simplicity; such plate is provided with vertical movement, top-bottom with respect to the container slide surface, in a manner so as to arrive aligned with said slide surface and allow the transfer.

 In addition, the plate is provided with movement that is
15 horizontal and radial with respect to the axis of the machine, hence with the possibility to position the selected and straightened container outside the machine.

 In addition, the plate is provided with movement on its axis that allows rotating on the plate itself.

20 In figure 2, instead, the plate is always outside the orienting machine; the container, exactly at the point in which the slide surface 4 is interrupted, freely falls below the slide surface (inside the machine), is abutted against a surface 8 and by means of an additional thrust means, the movement is actuated from inside the
25 machine, even if in lower position, to the plate, always outside the

machine in this case.

In the example, reference is made to a kind of pusher 7, but equivalent systems can be used such as a grip hand, thrust means or other types; generally, any suction system or mechanical grip
5 that grasps the container and carries it outside the machine, where a plate is situated.

Preferably the plate is part of the machine by means of a carousel or ring of plates which axially rotate with axis coinciding with the axis of the orienting machine.

10 In such case, the vertical movement is entrusted to the container.

The horizontal exit movement is entrusted to the grip member that transfers the container.

The orientation function is entrusted to the plate (which can
15 rotate on itself).

Preferably, the plate runs along this concentric circular path, always driven in rotation by the rotation of the machine.

With reference to figure 3, another embodiment variant is observed. Now, the ring of plates is always external and concentric
20 with respect to the orienting machine; nevertheless, the transfer occurs on the same surface 4 where the selected container is situated. The transfer once again occurs with thrust means 7, or grip means as in figure 2.

In such case, there is no vertical movement of the container.

25 The horizontal exit movement is entrusted to the grip

member that transfers the container.

The orientation function is entrusted to the plate (which can rotate on itself).

In the other enclosed figures, several lay-outs or distributions
5 of possible applications of the present rotary machine are shown,
with means for advancing the selected containers outside the
machine and adjacent thereto. In the other words, following the
advancement along said path - a path which generally can be
designed non-linear since it can also be non-circular if the plates
10 are not constrained by the machine and are driven by a catenary
(for example) - the container undergoes at least one further work
step, wherein with work steps it is intended one or more, on their
own or in combination, of the following: steps of filling, of labeling,
of sealing, of capping, of orientation, of inspection, of analysis of
15 the seal, and so forth.

In the illustrated examples, the containers, once selected and
ordered, are arranged aligned inside and moved along a circular
ring up to at least one exit or pick-up point; preferably in vertical
position.

20 Nevertheless, without departing from the requested
protective scope of the claimed device and method, it is possible to
operate on containers that are even horizontally arranged or
positioned, as long as they are at least each selected by the
selection means of the machine and arranged to be picked up by
25 the same.

By way of example, it is sufficient that the orienting machine and particularly the means set for selecting the container, typically known with the term of lifting element, has provided to separate the container from all those contained in the central loading hopper, or cone, where all the bulk containers are present, in order to give
5 rise to the method claimed herein in order to be actuated and protected.

Forming a first object of the invention is the method for moving the containers aligned in an orienting machine, which
10 provides for picking up, from said machine, the containers selected thereby and moving at least one part of these along a path outside the machine; said path being non-linear around the machine.

Provision is made for completing at least one circular and concentric transfer portion or section as part of said non-linear
15 path. Preferably said circular portion or section is concentric with respect to the orienting machine.

Following the advancement along said non-linear path the container undergoes at least one further work step, wherein with work steps it is intended one or more, on their own or in
20 combination, the following: steps of filling, of labeling, of sealing, of capping, of orientation, of inspection, of analysis of the seal, and so forth.

The work steps can then be completed with stand-alone apparatuses or even dedicated apparatuses. Said apparatuses are
25 illustrated in figures 4 to 9 and are identified with the reference

number 30.

According to that stated, provision is made for completing the movement of the container(s), along said non-linear external path, by means of support means; in addition to said movement, the
5 means can provide for one or more of the following movements:

- movement of the containers according to a vertical axis thereof, for the rotation and orientation of the container itself,
- vertical movement of the containers and positioning them on a different level with respect to that of pick up,
- 10 • movement of the containers according to a radial direction of the machine and exiting outside the same.

Also forming the object of the finding is the apparatus for the selection and movement of bulk containers, constituted by at least one orienting machine of bulk containers adapted to select the
15 containers and movement means adapted to support at least part of the containers selected by the orienting machine, extract them and move them outside the orienting machine; said movement path being at least one non-linear path, adjacent to the orienting machine itself.

20 The aforesaid non-linear path comprises at least one transfer portion or section that is circular and concentric with respect to the orienting machine.

Preferably but not exclusively, said support means are concentric and/or synchronized with the orienting machine.

25 Said support means are independent of the orienting

machine.

The apparatus comprises, distributed along said non-linear path, one or more work stations with which the container undergoes at least one or more work steps, on their own or in
5 combination, such as: steps of filling, labeling, sealing or capping, orientation, inspection, analysis of the seal etc....

In addition, the means for the movement along said non-linear external path are:

- a series of supports or plates provided with multiple degrees
10 of movement,
- a catenary 20 (figure 5) which in turn drives a series of supports or plates;
- said means, on their own or in combination, allow transferring the container from the orienting machine to the outside.

15 Said means for the movement are also movable according to a vertical axis thereof so as to allow the rotation according to the vertical axis, for the rotation and orientation of the container itself.

Said movable means for the movement are vertically movable for a positioning thereof on a different level with respect to the point
20 of pick-up of the container from the orienting machine.

Said movable means for the movement are movable according to a radial direction of the machine and to the outside of the same.

The apparatus comprises possible further grip or thrust
25 means for transferring the selected container from the machine to

the movement means, if the latter are external and cannot be arranged in proximity to the pick-up zone or point.

Preferably, the means for the movement and support of the containers, such as the abovementioned plates, are all arranged
5 concentric and external and are moved: either integrally constrained to the rotation axis of the orienting machine itself, or separated and independent, but in any case able to rotate synchronized with the lifting means, i.e. the lifting elements, and/or with the internal crown of the machine itself adapted to move the
10 straightened containers up to the exit point.

At such exit point, the containers are transferred and positioned on the plates by means of the above-described systems.

A first mode is the plate itself which picks up the container, is lowered and then exits from the machine. A second mode is
15 always given by the direct gripping of the container, which awaits the fall of the container before radially exiting and being positioned on a concentric circumference.

A third mode is that of always providing the plate positioned and rotating according to the axis of the machine and on the
20 concentric external circumference: now, however, the extract step, i.e. the movement of the selected container from inside the machine to outside the machine, occurs with thrust means.

One example of that stated above is illustrated in figures 1, 2 and 3.

25 Alternatively and generally, it can be achieved with grasping

means, such as grasping grippers, or via dedicated transfer star conveyors with means for mechanical grip or for suction.

In such case, before the movement along the non-rectilinear path, the intermediation of further transfer means is comprised and
5 provided.

CLAIMS

1. Method for moving containers aligned in an orienting machine, wherein within said rotary machine, a plurality of bulk containers are selected and ordered and possibly aligned or straightened, characterized in that it provides for
 - a. picking up, from said machine, the containers selected thereby and moving at least one part of these along a path outside the machine; said path being non-linear around the machine,
 - b. following the advancement along said non-linear path, the container undergoes at least one further work step, wherein with work steps it is intended one or more, on their own or in combination, of the following: steps of filling, of labeling, of sealing, of capping, of orientation, of inspection, of analysis of the seal, and so forth.
2. Method according to claim 1, characterized in that it provides for completing at least one circular and concentric transfer portion or section as part of said non-linear path.
3. Method according to claim 1 and 2, characterized in that said circular portion or section is concentric with respect to the orienting machine.
4. Method according to claim 1, characterized in that it provides for completing the movement of the container(s), along said non-linear external path, by means of support means; in addition to said movement, the means can provide for one or

more of the following movements:

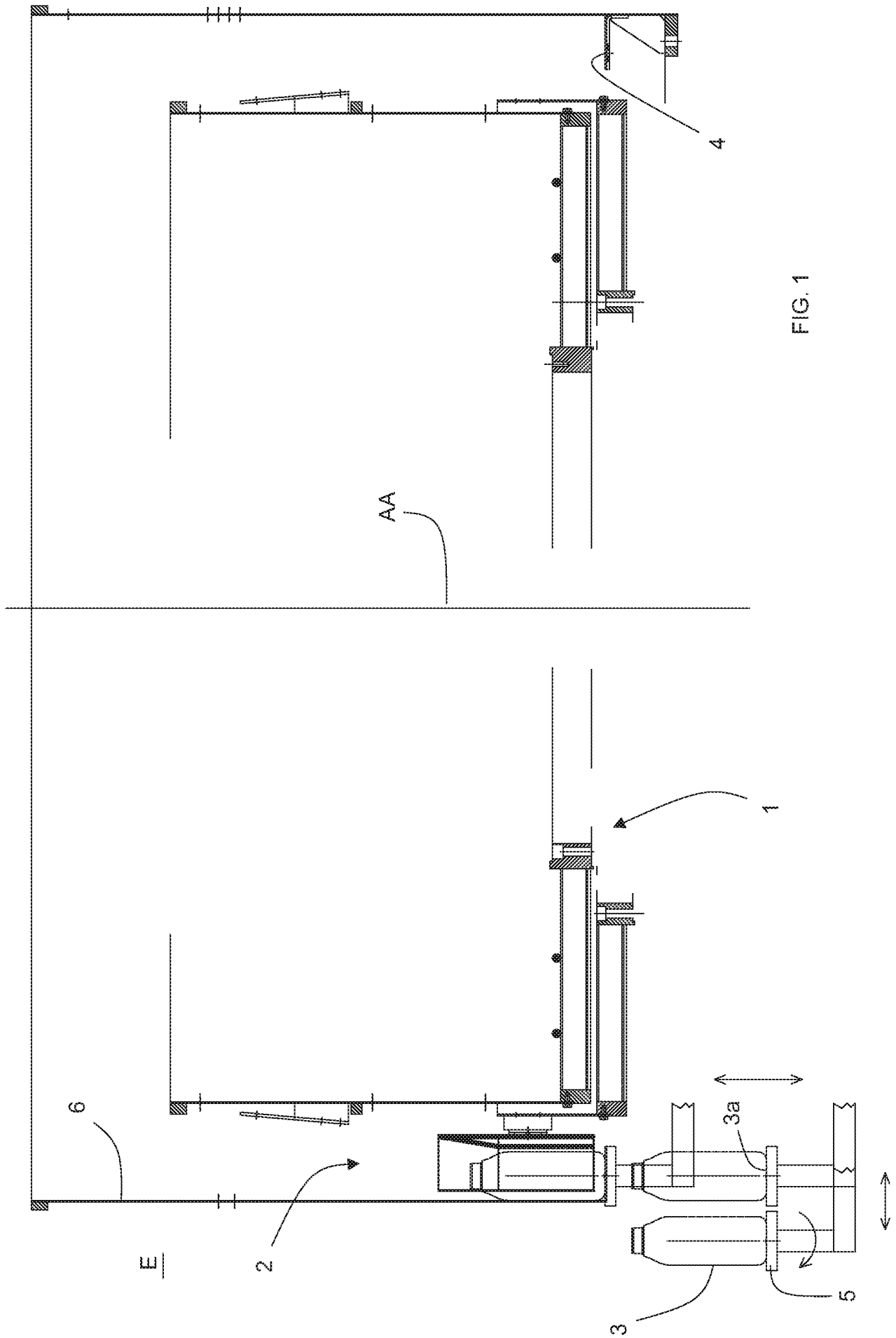
- a. movement of the containers according to a vertical axis thereof, for the rotation and orientation of the container itself,
 - 5 b. vertical movement of the containers and positioning them on a different level with respect to that of the pick-up,
 - c. movement of the containers according to a radial direction of the machine and exiting outside the same.
- 10 5. Apparatus for the selection and movement of bulk containers, the apparatus being constituted by at least one orienting machine of bulk containers adapted to select the containers, the apparatus characterized in that it comprises movement means adapted to support at least part of the containers
- 15 selected by the orienting machine, extract them and move them outside the orienting machine; said movement path being at least one non-linear path, adjacent to the orienting machine itself.
- 20 6. Apparatus, according to claim 5, characterized in that the aforesaid non-linear path comprises at least one transfer portion or section that is circular and concentric with respect to the orienting machine.
- 25 7. Apparatus, according to claim 5, characterized in that said support means are concentric and/or synchronized with the orienting machine.

8. Apparatus, according to claim 5, characterized in that said support means are independent of the orienting machine.
9. Apparatus, according to claim 5, characterized in that it comprises, distributed along said non-linear path, one or more work stations with which the container undergoes at least one or more work steps, on their own or in combination, such as: steps of filling, labeling, sealing or capping, orientation, inspection, analysis of the seal etc....
10. Apparatus, according to claim 5, characterized in that the means for the movement along said non-linear external path are:
- a. a series of supports or plates provided with multiple degrees of movement,
 - b. a catenary which in turn drives a series of supports or plates;
- said means, on their own or in combination, allow transferring the container from the orienting machine to the outside.
11. Apparatus, according to claim 5 and 10, characterized in that said means for the movement are also movable according to a vertical axis thereof so as to allow the rotation according to the vertical axis, for the rotation and orientation of the container itself.
12. Apparatus, according to claim 5 and 10, characterized in that said movable means for the movement are vertically

movable for a positioning thereof on a different level with respect to the point of pick-up of the container from the orienting machine.

13. Apparatus, according to claim 5 and 10, characterized
5 in that said movable means for the movement are movable according to a radial direction of the machine and to the outside of the same.
14. Apparatus, according to claim 5 and 10, characterized
10 in that it comprises possible further grip or thrust means for transferring the selected container from the machine to the movement means, if the latter are external and cannot be arranged in proximity to the pick-up zone or point.
15. Apparatus, according to claim 5 and 10, characterized
15 in that the movement and support means for the containers are all arranged concentric and external and are moved: either integrally constrained to the rotation axis of the orienting machine itself, or separated and independent, but in any case being able to rotate synchronized with the lifting means, i.e. the lifting elements, and/or with the internal
20 crown of the machine itself adapted to move the straightened containers up to the exit point; at such exit point, the containers are transferred and positioned directly on the plates or said extraction and transfer step, i.e. movement of the selected container from inside the machine to outside the
25 machine, occurs with grip or thrust means, or by means of

dedicated transfer star conveyors with means for mechanical grip or for suction.



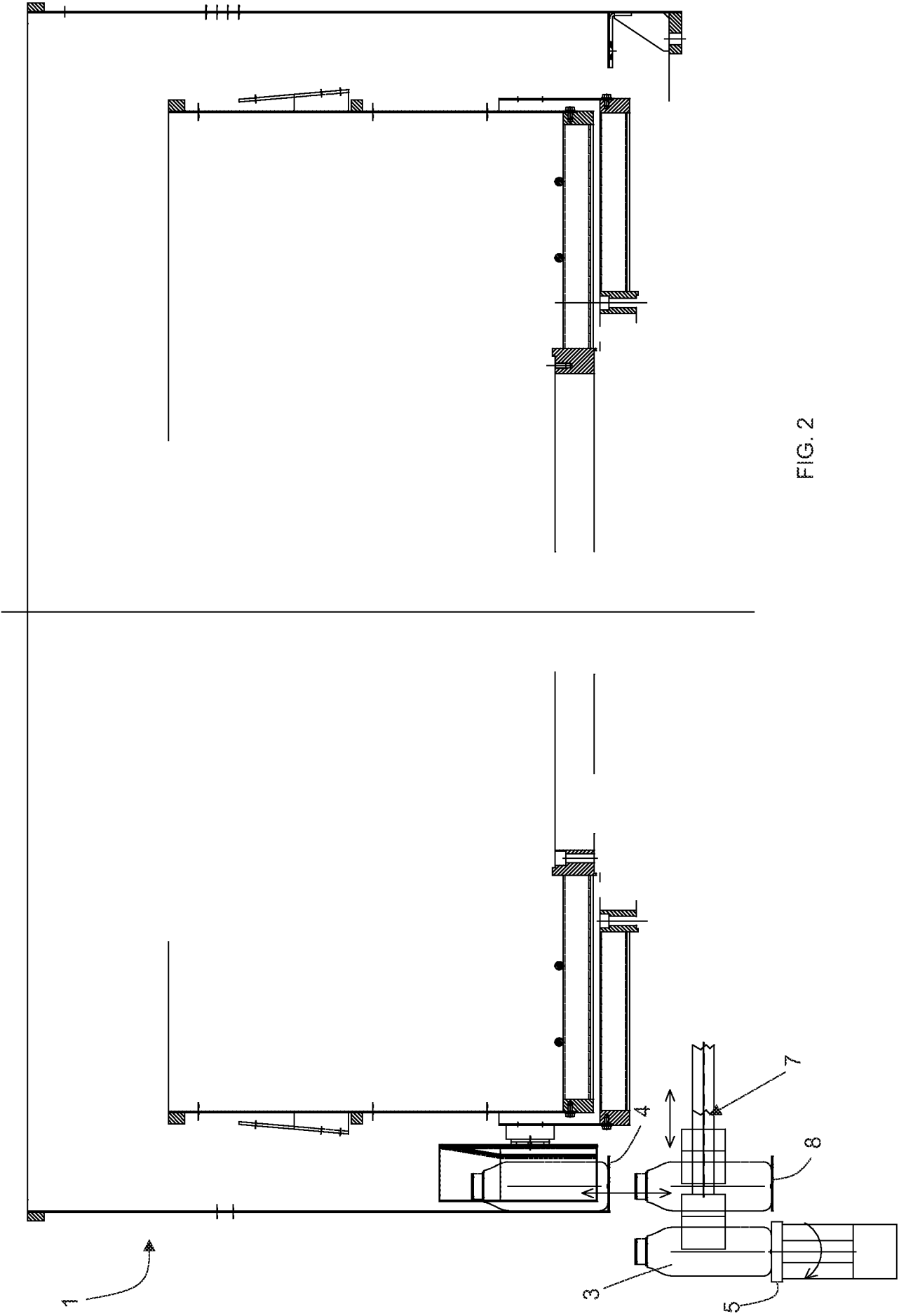


FIG. 2

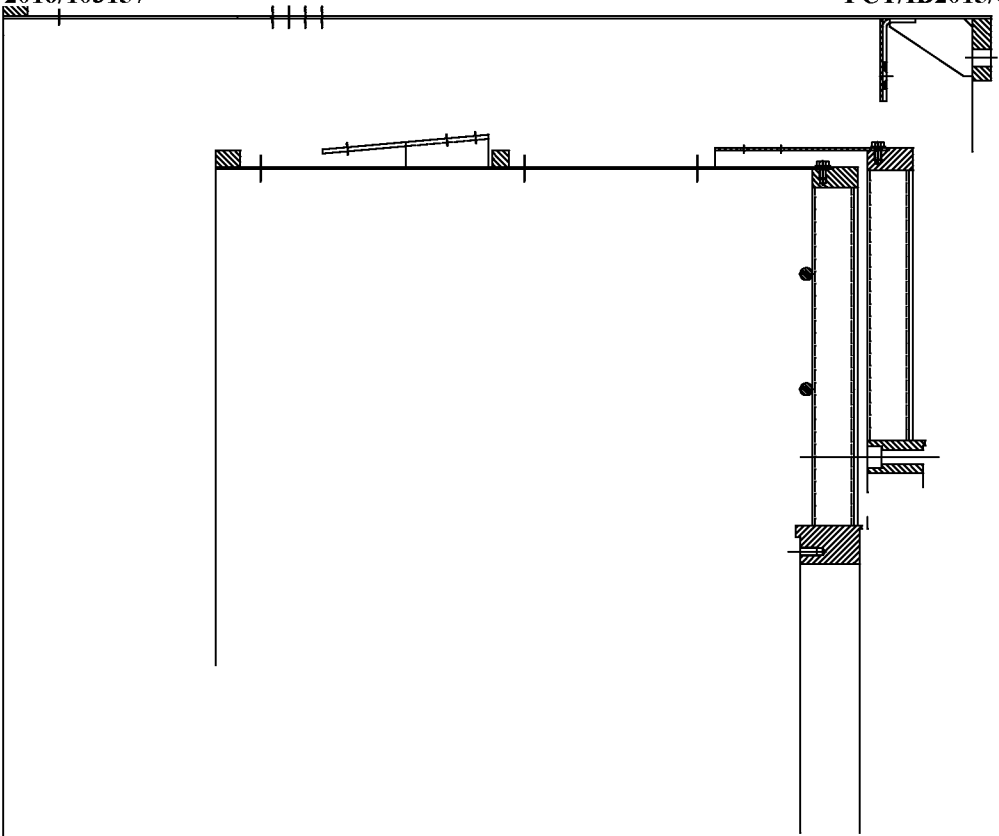
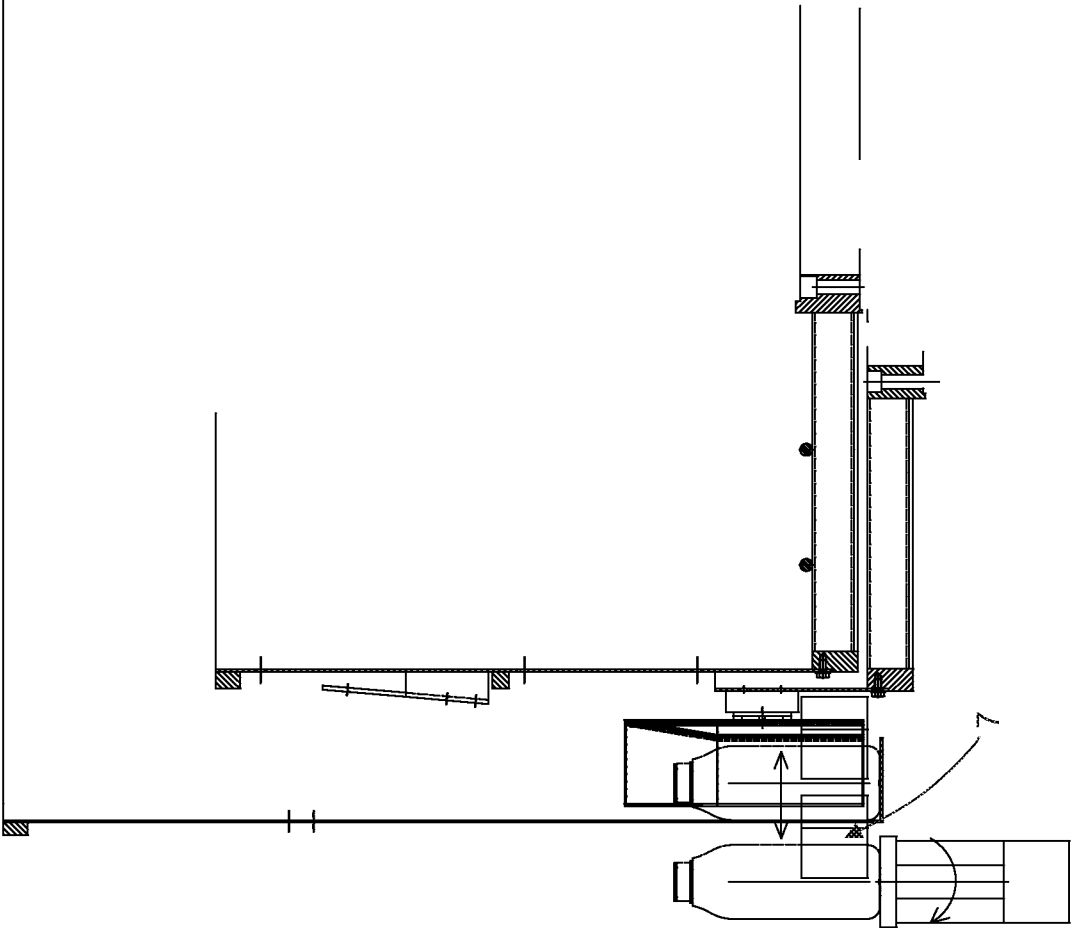


FIG. 3



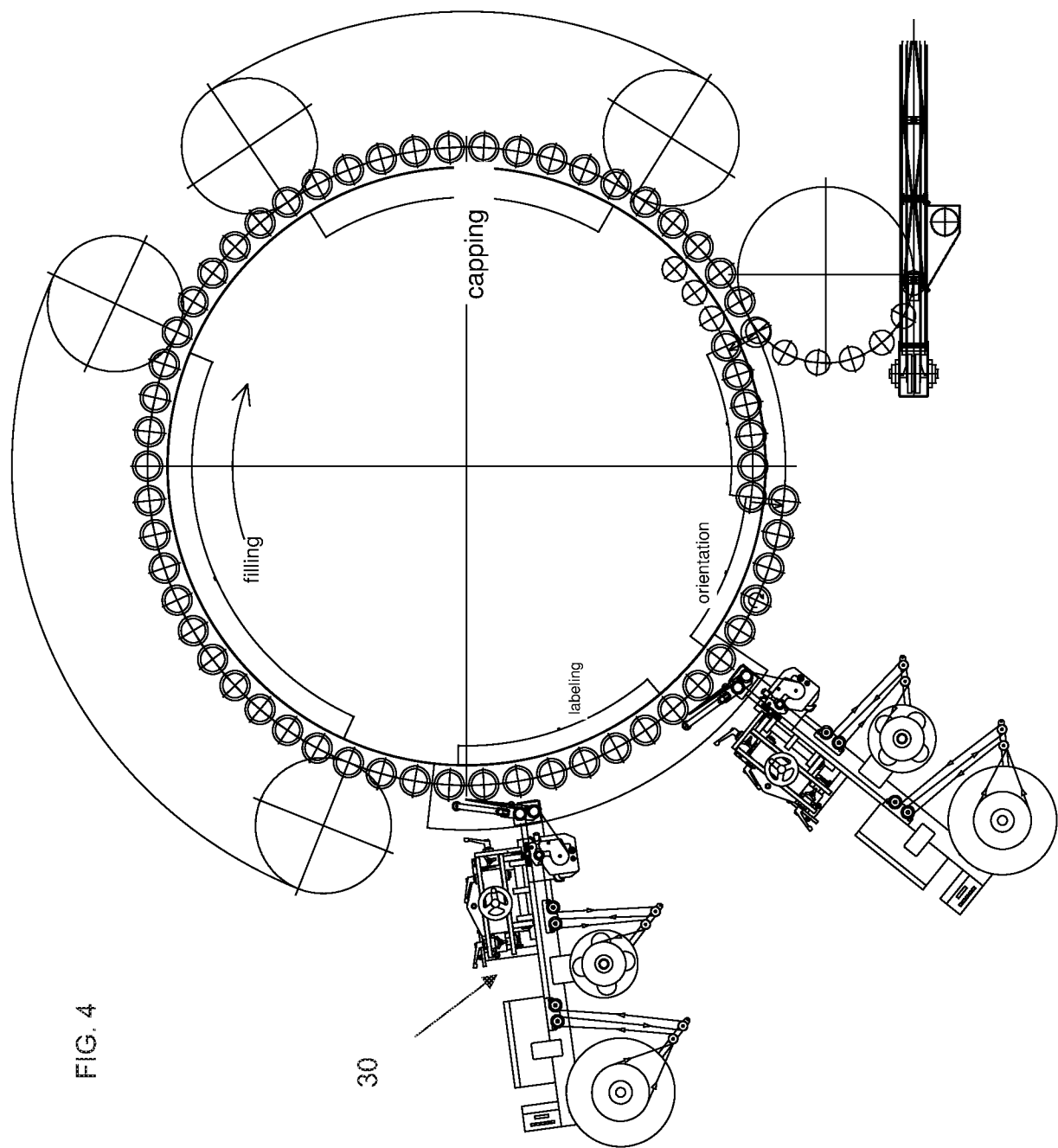


FIG. 4

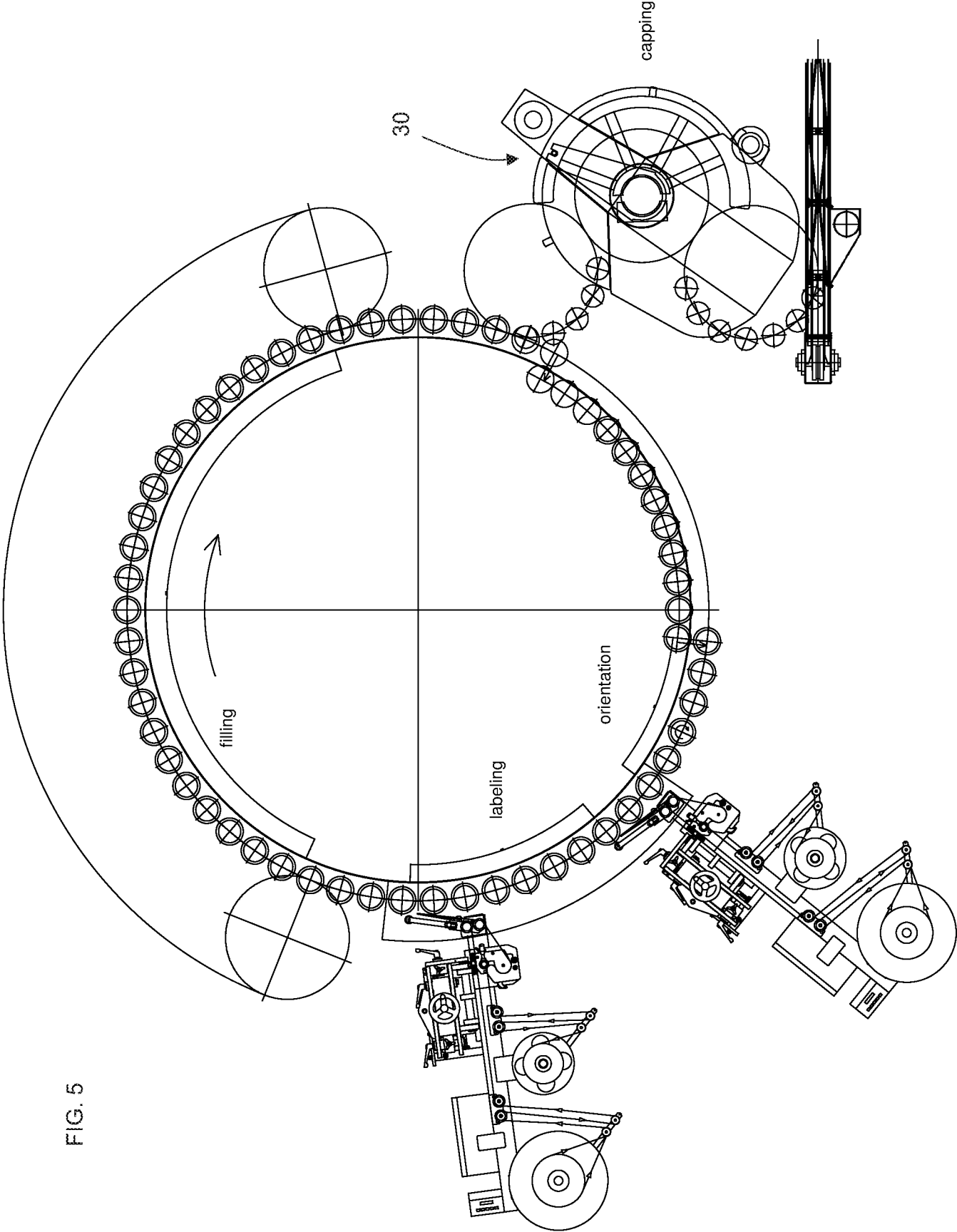


FIG. 5

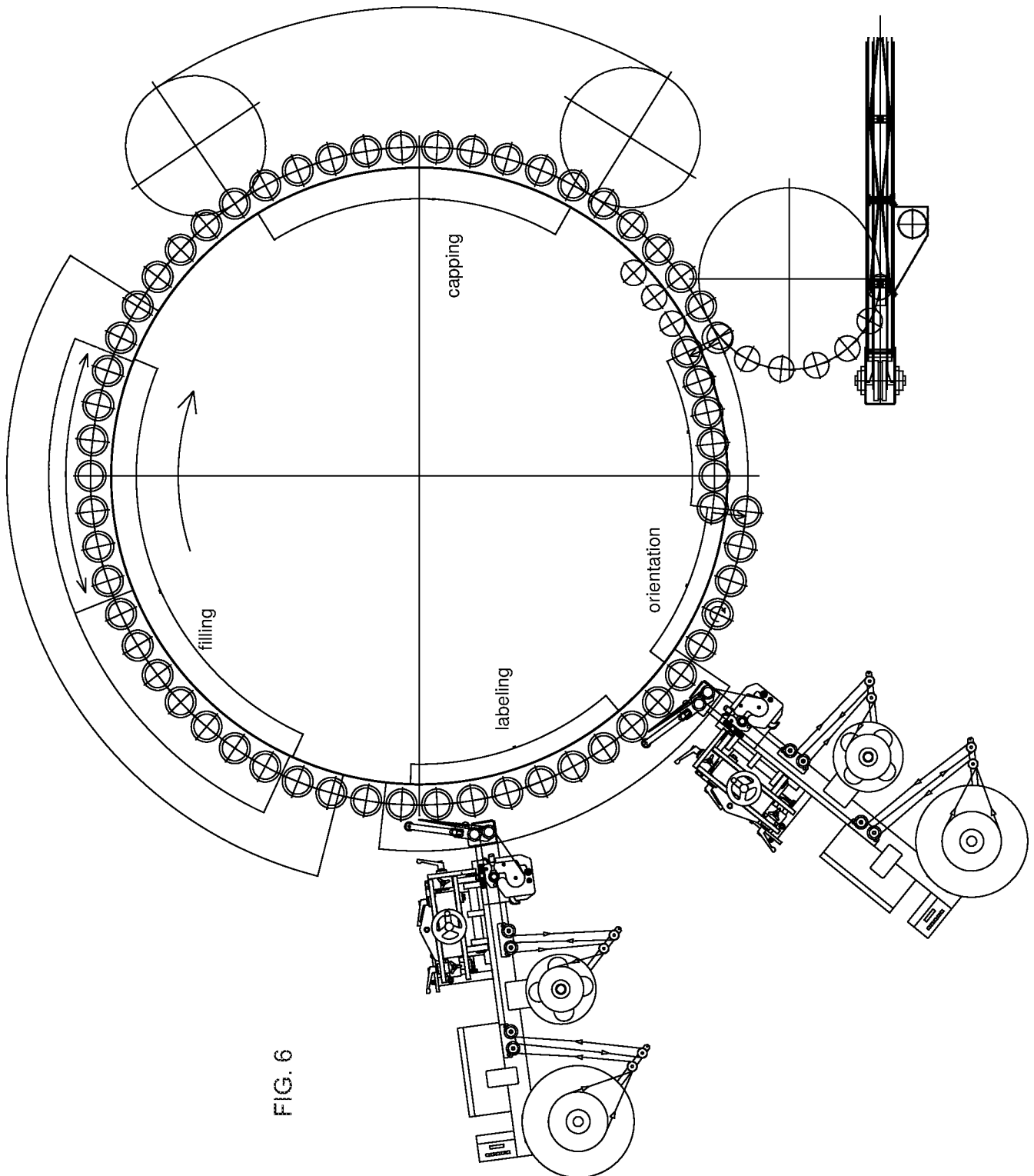


FIG. 6

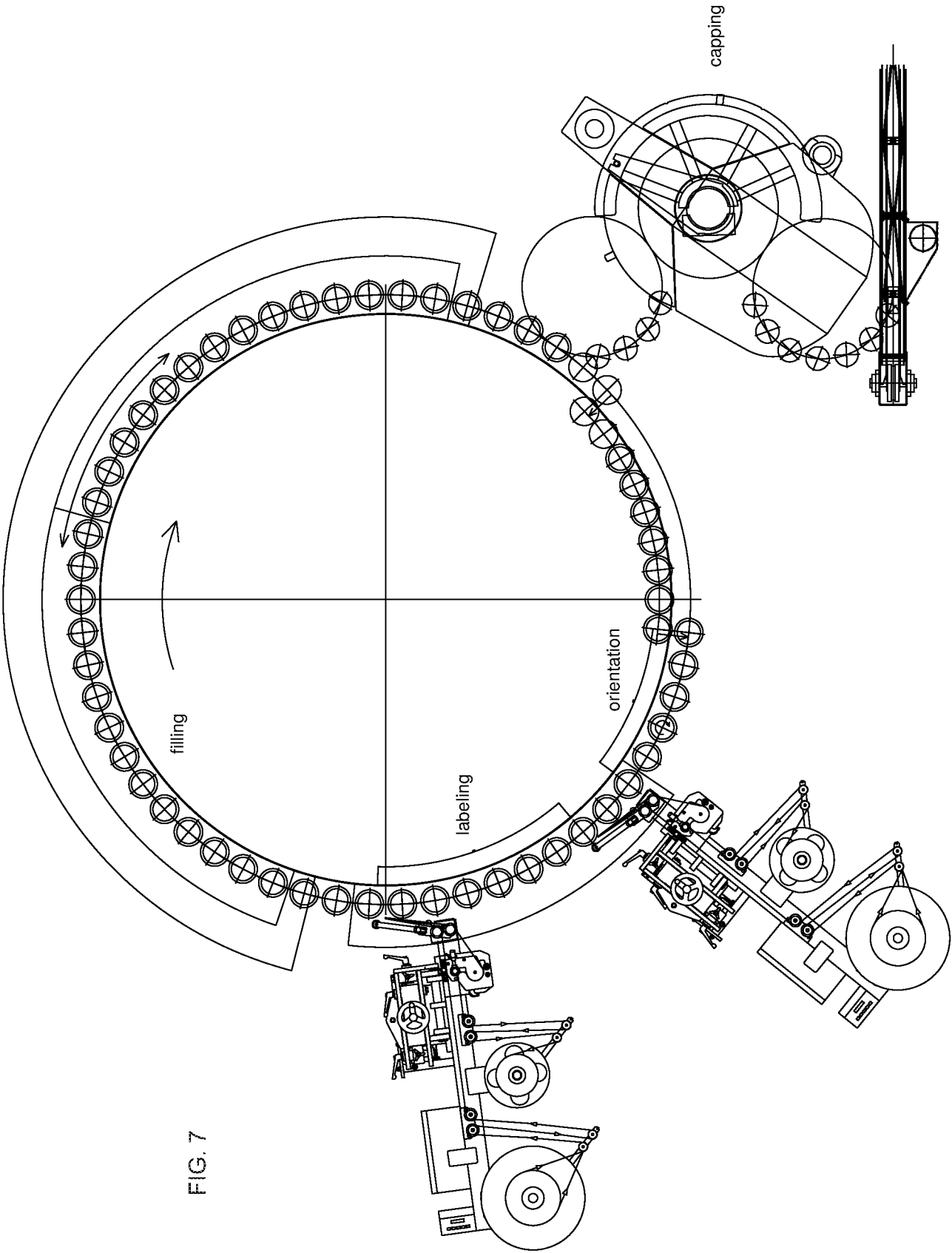
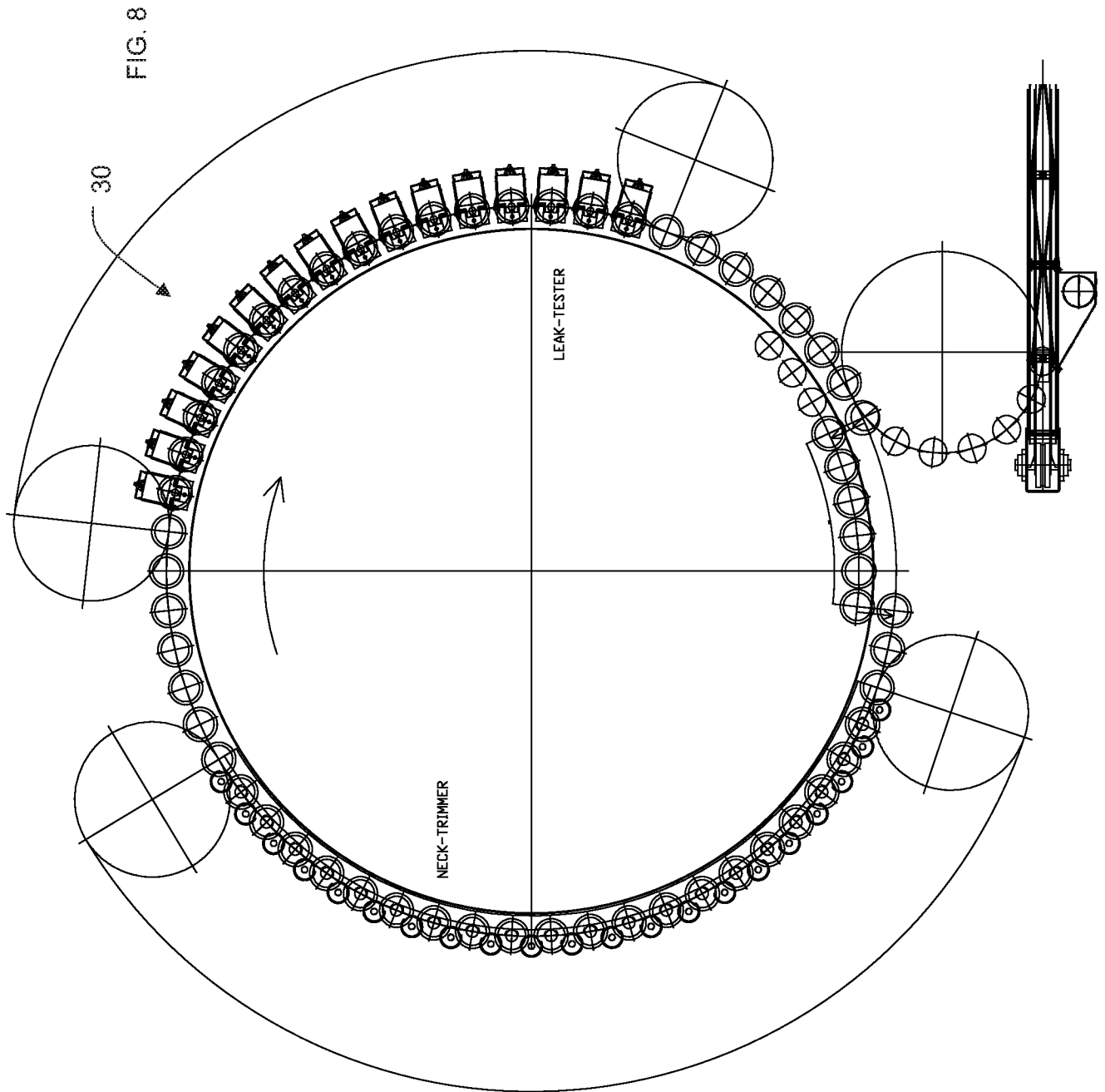


FIG. 7



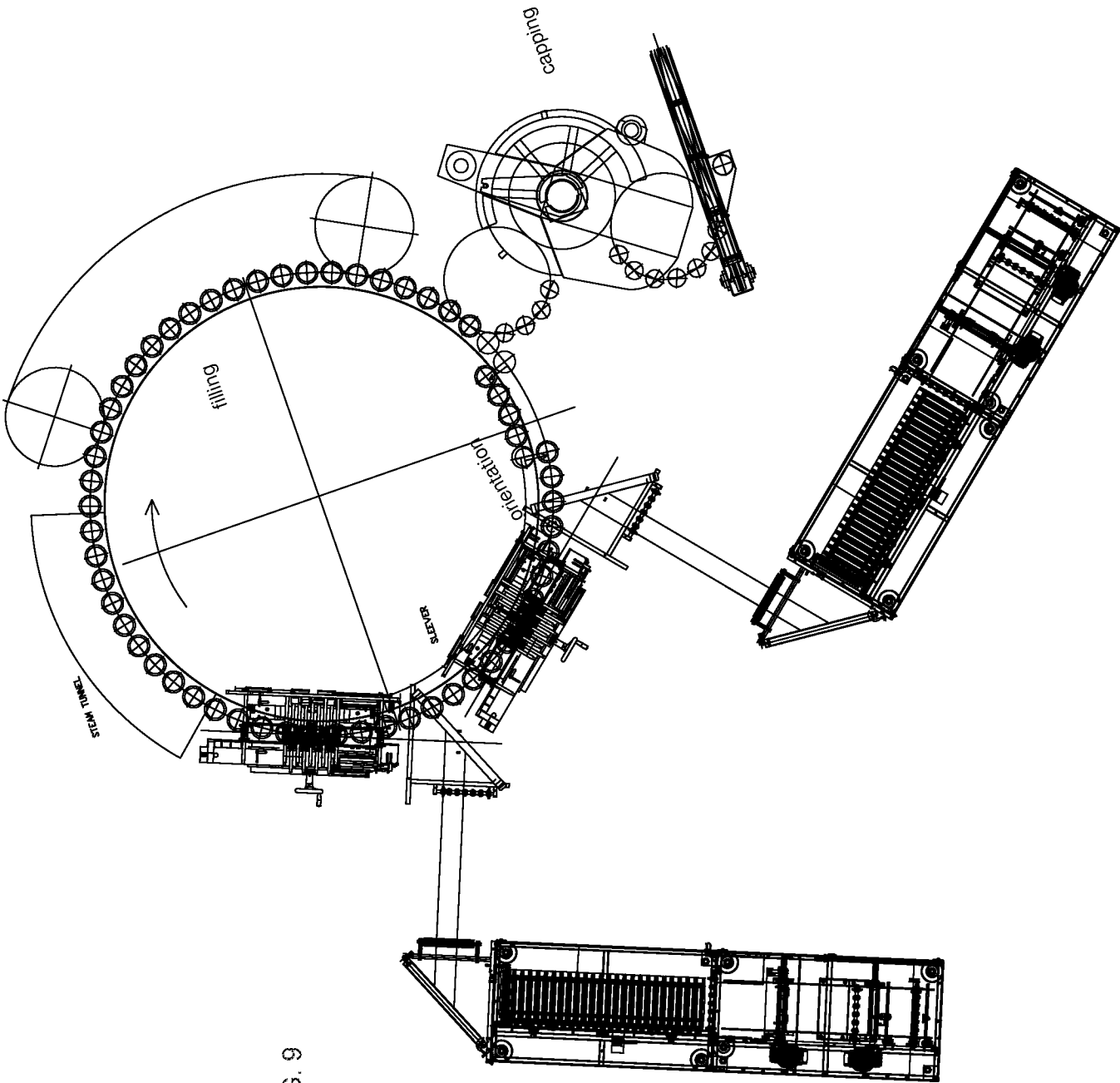
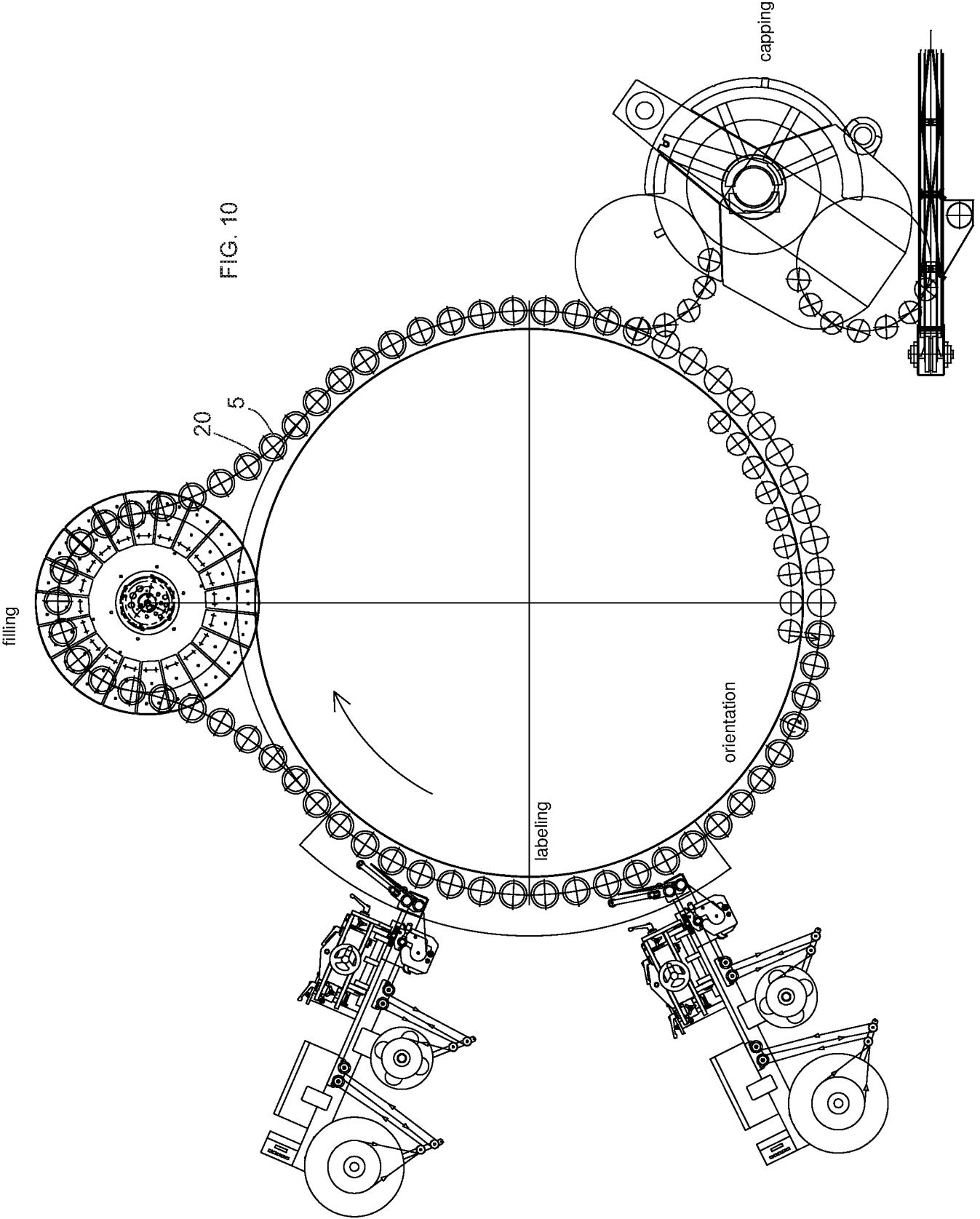


FIG. 9



INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2015/059846

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65G47/14

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

15 March 2016

Date of mailing of the international search report

22/03/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

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Martin, Benoit

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2015/059846

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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