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(71) Applicant: GIMA S.P.A. [IT/IT]; Via Kennedy, 17,
40069 Zola Predosa (IT).

(72) Inventor: SASSI, Fabio; C/o Gima S.p.A., Via Kennedy,
17, 40069 Zola Predosa (IT).

(74) Agent: MODIANO, Micaela; Modiano & Partners, Via
Meravigli, 16, 20123 Milano (IT).

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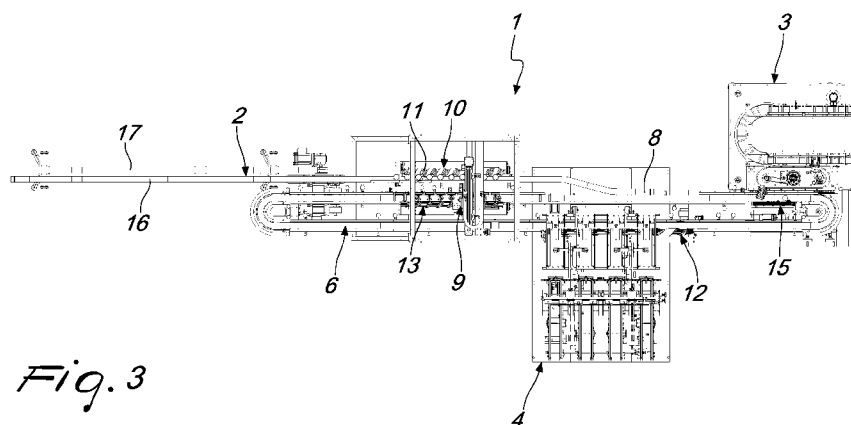


Fig. 3

(57) Abstract: A station (1) for forming a protective enclosure around a bottle (A), comprising a line (2) for supplying the bottles (A) and a casing machine (3), and comprising at least one assembly (4) for forming protective enclosures (5), at least one path (6) for conveying containers (7) for accommodating the formed protective enclosures (5), dispensed by the assembly (4); the at least one path (6) merges in the line (2) for supplying bottles (A), upstream of the casing machine (3); the station (1) further comprises at least one apparatus (9) for picking up bottles from the line (2) and arranging each one of them within respective containers (7) arranged on the at least one path (6); the at least one apparatus (9) is arranged upstream of the intersection (8) of the line (2) with the path (6).

STATION FOR FORMING A PROTECTIVE ENCLOSURE AROUND A BOTTLE

The present invention relates to a station for forming a protective enclosure around a bottle.

5 The packaging of bottles can have some difficulties in relation to the fact that the bottles can be delicate (therefore requiring delicate handling).

The delicateness of the bottles is a sensitive parameter during packaging but also during the subsequent transport steps: for this reason it is necessary to provide, in some cases, for the presence of a protective enclosure to be interposed between the bottle and the case that will
10 accommodate it.

In particular, it should be noted that in sectors such as cosmetics, perfumery and the like, the bottles generally also have a particular aesthetic value and therefore the case that will have to contain them also will be
15 characterized by a pleasant appearance and shape.

Packaging machines of the known type are not versatile: there are therefore high-speed machines, which are normally provided with a continuous motion and are adapted exclusively to package a bottle within a respective case, without interposing the protective enclosure between them,
20 and different low-speed machines, which are normally provided with an alternating motion and are adapted to package a bottle within a respective case with or without the interposition of the protective enclosure between them.

Furthermore, the need to handle the products with the greatest
25 possible care entails the exclusive use of expensive dedicated packaging machines.

It is therefore evident that the high costs and poor versatility make the packaging plants that comprise these machines very expensive during purchase and also in case of subsequent extraordinary maintenance in order
30 to adapt them to new types of product to be processed.

It is also necessary to point out that not all machines for packaging bottles of the known type are suitable to be arranged in series to any type of plant for filling and closing bottles.

The bottles that have just been filled and closed might in fact arrive at
5 the machine continuously, alternately, at a different hourly rate, and machines of the known type are not always suitable to adapt to all these variables.

The aim of the present invention is to solve the problems described above, by proposing a station for forming a protective enclosure around a
10 bottle that is versatile, i.e., suitable to process bottles that require or not the protective layer interposed between said bottle and the corresponding case, ensuring in any case high production rates.

Within this aim, an object of the invention is to propose a station for forming a protective enclosure around a bottle that is suitable to process
15 delicate bottles and cases, as typically occurs with products of the cosmetic sector and of perfumery.

Another object of the invention is to propose a station for forming a protective enclosure around a bottle in which the operations for changing format are simple.

20 Another object of the invention is to propose a station for forming a protective enclosure around a bottle that is adapted to be controlled by any bottle filling and closing plant.

A further object of the present invention is to provide a station for forming a protective enclosure around a bottle that has modest costs, is
25 relatively simple to provide in practice and is safe in application.

This aim and these and other objects which will become better apparent hereinafter are achieved by a station for forming a protective enclosure around a bottle, of the type comprising a line for supplying the bottles and a casing machine, characterized in that it comprises

30 – at least one assembly for forming protective enclosures,

– at least one path for conveying containers for accommodating said formed protective enclosures, dispensed by at least said assembly, at least one path merging in said line for supplying bottles, upstream of said casing machine,

- 5 – at least one apparatus for picking up bottles from said line and arranging each one of them within respective containers arranged on said at least one path, said at least one apparatus being arranged upstream of said intersection of said line with said path.

Further characteristics and advantages of the invention will become
10 better apparent from the description of a preferred but not exclusive embodiment of the station for forming a protective enclosure around a bottle, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a top view of a plant comprising a station for forming a
15 protective enclosure around a bottle according to the invention;

Figure 2 is a top view of a station for forming a protective enclosure around a bottle according to the invention in the configuration for direct casing of the bottles;

Figure 2a is an enlarged-scale top view of Figure 2;

20 Figure 3 is a top view of a station for forming a protective enclosure around a bottle according to the invention in the configuration for casing the bottles with the interposition of a protective enclosure;

Figure 3a is an enlarged-scale top view of Figure 3;

Figure 4 is a perspective view of a container that accommodates a
25 protective enclosure and a bottle.

With reference to the figures, the reference numeral 1 generally designates a station for forming a protective enclosure around a bottle A.

The station 1 comprises a line 2 for supplying the bottles A and a casing machine 3.

30 The station 1 comprises at least one assembly 4 for forming protective

enclosures 5 and at least one conveyance path 6 for containers 7 for accommodating the formed protective enclosures 5, previously dispensed by the at least one assembly 4.

The at least one path 6 converges into the line 2 for supplying bottles
5 A, in particular into a downstream portion 8 thereof, which is arranged directly upstream of the casing machine 3.

It is specified that the station 1 according to the invention further comprises at least one apparatus 9 for picking up bottles A from the line 2 and for arranging them individually within respective containers 7 arranged
10 along the at least one path 6.

The at least one apparatus 9 is arranged upstream of the intersection region 8 of the line 2 with the path 6.

The station 1 comprises, along the line for supplying the bottles A, substantially in alignment with the apparatus 9 for picking up bottles A, a
15 device 10 for calibrated mutual spacing of the bottles A for the correct pick-up thereof on the part of the apparatus 9.

The plant that is located upstream and is designed to fill and close the bottles A delivers them according to specific criteria: the bottles A can arrive at the line 2 with a continuous or alternating flow that has a
20 predefined rate.

It is therefore evident that in order to allow the apparatus 9 to pick up the bottles A and transfer them onto the path 6, the bottles A must be in a specific and precise position: this arrangement is ensured by the calibrated mutual spacing device 10, which generates a predefined condition of
25 alignment and synchronization between the bottles A to be picked up and the pick-up means of the apparatus 9.

It is appropriate to specify that the calibrated mutual spacing device 10, in a particularly effective and functional embodiment thereof, comprises a screw feeder 11, the at least one ridge of which protrudes along the supply
30 line and interferes with the bottles A.

During the alignment action performed by the screw feeder 11 on the bottles A, each bottle A is accommodated temporarily in the recess delimited between two contiguous portions of the ridge.

In this manner, even if grip means of the apparatus 9 capable of
5 picking up simultaneously a plurality of bottles A from the line 2 are provided, it is sufficient to have a sufficiently long screw feeder 11 (i.e., provided with a number of recesses that is equal to the number of grip means of the apparatus 9) in order to allow correct simultaneous pick-up.

According to an embodiment of unquestionable interest in practice
10 and in application, the at least one assembly 4 for forming protective enclosures 5 comprises at least one magazine for substantially planar contoured sheets, at least one apparatus for folding said sheets and at least one pusher for inserting at least one folded sheet within a respective container 7 arranged along the path 6.

15 In order to ensure easy insertion of the protective enclosures 5 within the respective containers 7, the at least one conveyance path 6 for containers 5 for accommodating the protective enclosures 7 that have been formed can advantageously comprise a first unit 12 for the calibrated mutual spacing of the containers 7 for the correct insertion of at least one folded sheet within
20 each one of them on the part of a respective pusher, said sheet thus assuming the shape of the protective enclosure 5.

According to a particularly efficient and functional constructive architecture, the line 2 and the path 6 face each other and are proximate at the apparatus 9 for picking up bottles A from the line 2 and for arranging
25 each one within respective containers 7 arranged on the at least one path 6.

In this manner, the apparatus 9 can be constituted simply by a supporting band for a plurality of mutually side by side and spaced grip means, said band being arranged on an actuated carriage, which can translate from a configuration of alignment with the line 2 (in which it
30 surmounts said line) to a configuration of alignment with the path 6 (in

which it surmounts it).

With particular reference to the constructive architecture described previously (alignment and parallel arrangement of the line 2 with respect to the path 6), it is specified that the path 6 preferably comprises, at the pick-up and arrangement apparatus 9, a second unit 13 for calibrated mutual spacing of the containers 7 for their alignment with the delivery points of the apparatus 9.

The calibrated mutual spacing device 10 for the bottles A that is arranged on the line 2 and the second unit for calibrated mutual spacing 13 of the containers 7 on the path 6 ensure that the apparatus 9 can pick up the bottles A and deliver them inside the containers 7 precisely, avoiding any misalignments which might damage the bottle A itself or the protective enclosure 5.

In order to allow use of station 1 even if the package complete with the bottle A does not comprise the protective enclosure 5, the line 2 for supplying the bottles A, in substantial alignment with the apparatus 9 for picking up bottles A, comprises a removable lateral band 14 for the alignment of the bottles A with a lateral edge of the line 2.

The removable lateral band 14 has the purpose of diverting the bottles A and of keeping them in a configuration in which they do not interfere with the device 10 (in particular, spaced from the ridges of the screw feeder 11).

When in fact it is not necessary to pick up the bottles A from the line 2, i.e., in those cases in which the packages of the bottles A do not require the presence of the protective enclosure 5 and in which therefore it is not necessary to pick them up from the line 2 in order to insert them in the containers 7 that are present along the path 6 (within which the protective enclosure 5 is arranged), one proceeds with the exclusion of the device 10 so that the bottles A can slide along the line 2 until they arrive at the casing machine 3 that is arranged at the end portion of the line 2 (since it is not necessary to arrange them in step, as they do not need to be picked up by the

apparatus 9).

In this case, the region of intersection 8 is configured appropriately so as to guide the bottles A during transfer from the line 2 to the path 6.

It is specified that at the end portion of the supply line 2 (i.e.,
5 downstream of the region of intersection 8 of the line 2 with the path 6) there is a third unit 15 for calibrated mutual spacing of elements chosen among the containers 7 that contain the formed protective enclosures 5 that accommodate a respective bottle A and the bottles A.

The third unit for calibrated mutual spacing 15, in the case in which
10 the bottles A arrive directly from the line 2 without having been associated beforehand with any protective enclosure 5, arranges the contiguous bottles A at the correct mutual distance to allow the grip means of the casing machine 3 to pick them up one at a time and process them to insert them within a respective case.

15 If instead the bottles A arrive from the path 6, along which they are conveyed within respective containers 7 and are covered (at least partially) with the protective enclosure 5, the third calibrated mutual spacing unit 15 arranges the contiguous containers 7 (each of which comprises at least one protective enclosure 5 within which at least one bottle A is accommodated)
20 at the correct mutual distance in order to allow the grip means of the casing machine 3 to pick them up one at a time and process them to insert them in a respective case.

It should be noted that the casing machine 3 comprises an element for picking up at least one container 7 at a time from the third unit 15 for the
25 insertion of the bottle A, which is accommodated within the respective protective enclosure 5, in a respective case: it is therefore pointed out that the pick-up element of the casing machine 3 is capable of picking up simultaneously the bottle A and the protective layer 5.

In any case, the alternative adoption of grip means of another type,
30 for example mechanical clamps with electrical or pneumatic actuation, is in

any case not excluded.

The possibility is provided to adopt, as a pick-up element of the casing machine 3, a group of suckers associated with a common suction circuit, of which at least one is suitable to grip the bottle A and at least
5 another one is suitable to grip the protective enclosure 5.

It is deemed useful to specify that the line 2, in its initial portion, is constituted by two branches 16 and 17.

A main branch 16 merges without discontinuity with the portion of the line 2 that is aligned with the apparatus 9 and is preset to convey the
10 bottles A that arrive from an upstream machine preset for their filling and their closure.

An auxiliary branch 17 instead performs the function of temporary storage unit (buffer) if the station 1 has a malfunction and it is necessary to interrupt its operation.

15 In particular, it is specified that if the station 1 experiences a malfunction that forces the interruption of its service, a production queue (which arrives from the upstream machinery) will occur and will in any case reach the station 1 even after the interruption.

The auxiliary branch has the purpose of collecting and storing the
20 bottles A that correspond to this production queue (which is inevitable, since the upstream machinery must necessarily finish the filling and closure of the bottles A already been processed).

As soon as the station 1 is restarted, the possibility is provided to transfer the bottles A from the branch 17 to the portion of the line 2 that is
25 proximate to the apparatus 9 (by means of suitable redirection elements): it is therefore immediately possible to start the packaging operations even if the upstream machinery has not yet begun to dispense bottles A.

Moreover, it is deemed useful to specify, finally, that the casing machine comprises a respective apparatus 18 for supplying and forming (at
30 least partially) the cases, which is arranged upstream of the means for

gripping the bottle A (alone or covered, at least partially, by the protective enclosure 5).

The station 1 can work only in an alternating mode, while the casing machine can operate both in a continuous mode and in an alternating mode;
5 the station 1 is suitable to perform packaging operations that provide for the presence of the protective enclosure 5 or not, depending on the specific production requirements.

It is therefore evident that the station 1 is particularly versatile and suitable for the packaging of bottles intended for the cosmetic and/or
10 perfumery sector. It is in any case evident that the station 1 according to the invention is suitable for the packaging of bottles designed also for other sectors, including also the pharmaceutical sector.

Advantageously, the present invention solves the problems described earlier, proposing a station 1 for forming a protective enclosure around a
15 bottle A that is versatile, i.e., suitable to process bottles A which require or not the protective layer (protective enclosure 5) interposed between the bottle A and the corresponding case.

Validly, the station 1 is suitable to process delicate bottles A and cases, as typically occurs with products of the cosmetic and perfumery
20 sectors.

The operations for transporting and handling the bottles A provided by the station 1 in fact allow to minimize impacts and friction of the bottles A and of the protective enclosures 5 in order to keep each bottle A and each component of its packaging perfectly intact.

25 Efficiently, the station 1 ensures the execution of the format changing operations in a simple manner: simple mechanical interventions and the enabling (by virtue of management software) of the path 6 and of the at least one assembly for forming protective enclosures 5 are sufficient in order to pass from the direct packaging of bottles A within respective cases to a
30 packaging that also provides for the presence of the protective enclosure 5

interposed between the bottle A and the case.

Conveniently, the station 1 is adapted to be controlled by any system for filling and closing the bottles A: it in fact comprises an auxiliary branch 17, which forms a dynamic magazine for the temporary accumulation of bottles A, which in case of machine downtime collects the bottles A in output during the stop of the machine arranged upstream, which fills and closes the bottles A.

Advantageously, the present invention provides a station 1 for forming a protective enclosure around a bottle A that has substantially modest costs and is relatively simple to provide in practice, these characteristics ensuring the safe industrial application of the station 1 according to the invention.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

In practice, the materials used, as well as the dimensions, may be any according to the requirements and the state of the art.

The disclosures in Italian Patent Application No. 102015000088910 (UB2015A009788) from which this application claims priority are incorporated herein by reference.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

CLAIMS

1. A station for forming a protective enclosure around a bottle (A), of the type comprising a line (2) for supplying the bottles (A) and a casing machine (3), characterized in that it comprises:

- 5 – at least one assembly (4) for forming protective enclosures (5),
 – at least one path (6) for conveying containers (7) for accommodating said formed protective enclosures (5), dispensed by at least said assembly (4), at least one path (6) merging in said line (2) for supplying bottles (A), upstream of said casing machine (3),
10 – at least one apparatus (9) for picking up bottles from said line (2) and arranging each one of them within respective containers (7) arranged on said at least one path (6), said at least one apparatus (9) being arranged upstream of the intersection (8) of said line (2) with said path (6).

2. The station according to claim 1, characterized in that it comprises,
15 along said line (2) for supplying the bottles (A) substantially aligned with said apparatus (9) for picking up bottles (A), a device (10) for the calibrated mutual spacing of said bottles (A) for the correct pick-up thereof by said apparatus (9).

3. The station according to claim 2, characterized in that said device
20 (10) for the calibrated mutual spacing of said bottles (A) comprises a screw feeder (11), the at least one ridge of which protrudes along said supply line (2) and interferes with said bottles (A), each one of said bottles (A) being accommodated temporarily in the recess delimited between two contiguous portions of said ridge.

25 4. The station according to claim 1, characterized in that said at least one assembly (4) for forming protective enclosures (5) comprises at least one magazine for substantially planar contoured sheets, at least one apparatus for folding said sheets and at least one pusher for inserting at least one said folded sheet inside a respective container (7) arranged on said path
30 (6).

5. The station according to claim 4, characterized in that said at least one conveyance path (6) for containers (7) for accommodating said formed protective enclosures (5) comprises a first unit (12) for the calibrated mutual spacing of said containers (7) for the correct insertion of at least one said folded sheet inside each one of them by said at least one pusher.

6. The station according to claim 1, characterized in that at said apparatus (9) for picking up bottles (A) from said line (2) and for arranging each one of them within respective containers (7) arranged on said at least one path (6) said line (2) and said path (6) face each other and are mutually proximate.

7. The station according to claim 1, characterized in that said path (6) comprises, at said pick-up and arrangement apparatus (9), a second unit (13) for the calibrated mutual spacing of said containers (7) for the alignment thereof with the delivery points of said apparatus (9).

8. The station according to claim 1 or 2 and 3, characterized in that it comprises, along said line (2) for supplying the bottles (A) in substantial alignment with said apparatus (9) for picking up bottles (A), a removable lateral band (14) for the alignment of said bottles (A) with a lateral edge of said line (2).

9. The station according to one or more of the preceding claims, characterized in that at the end portion of said supply line (2) there is a third unit (15) for the calibrated mutual spacing of elements chosen between said containers (7) containing said formed protective enclosures (5) accommodating a respective bottle (A) and said bottles (A).

10. The station according to claim 9, characterized in that said casing machine (3) comprises an element for picking up at least one container at a time from said third unit (15) in order to insert said bottle (A), accommodated inside said protective enclosure (5), in a respective casing.

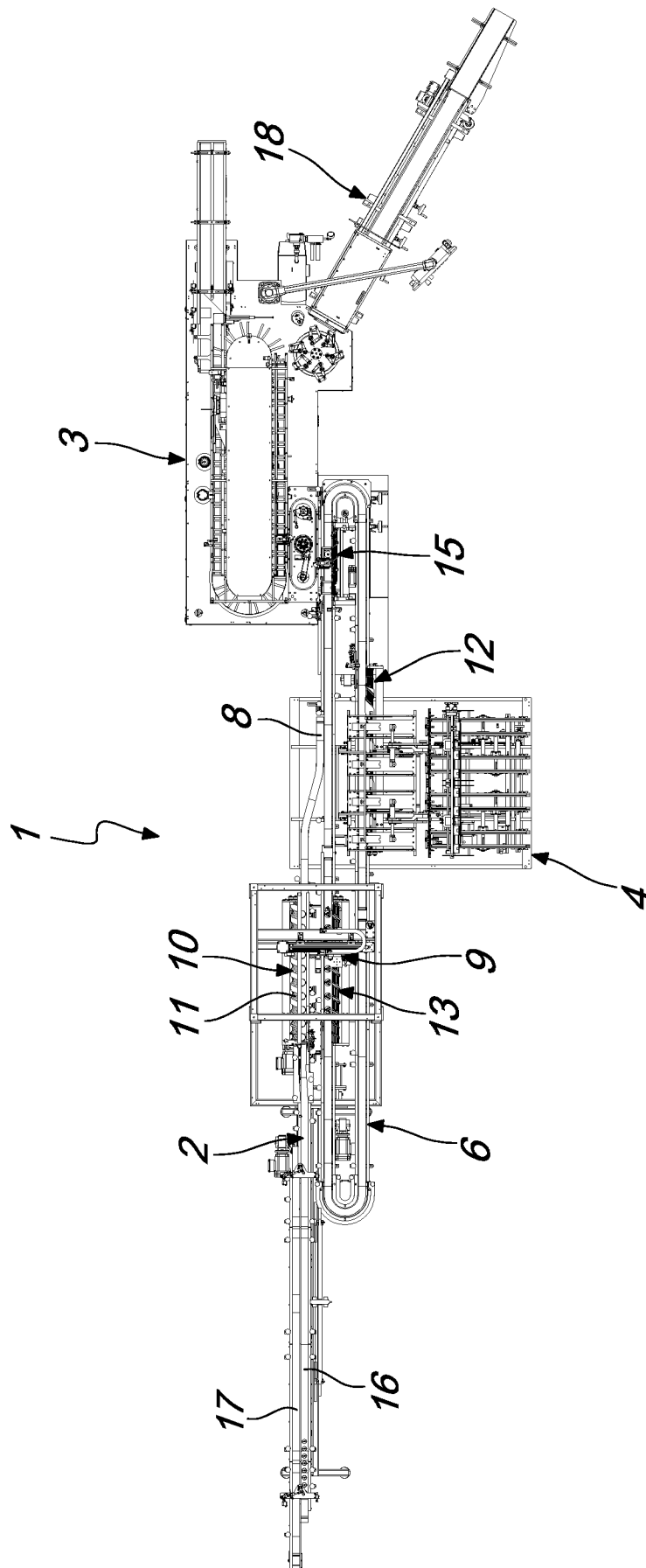


Fig. 1

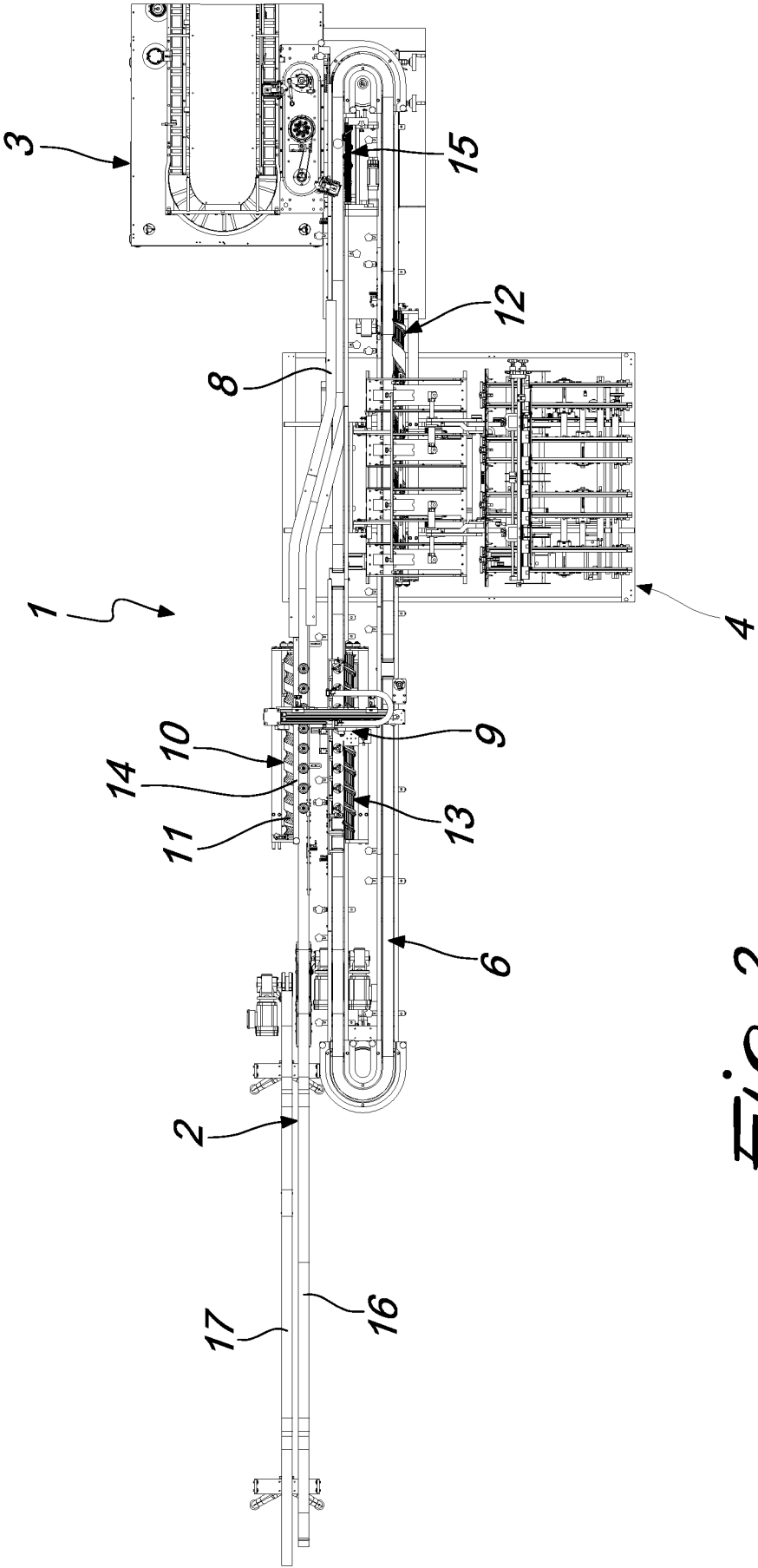


Fig. 2

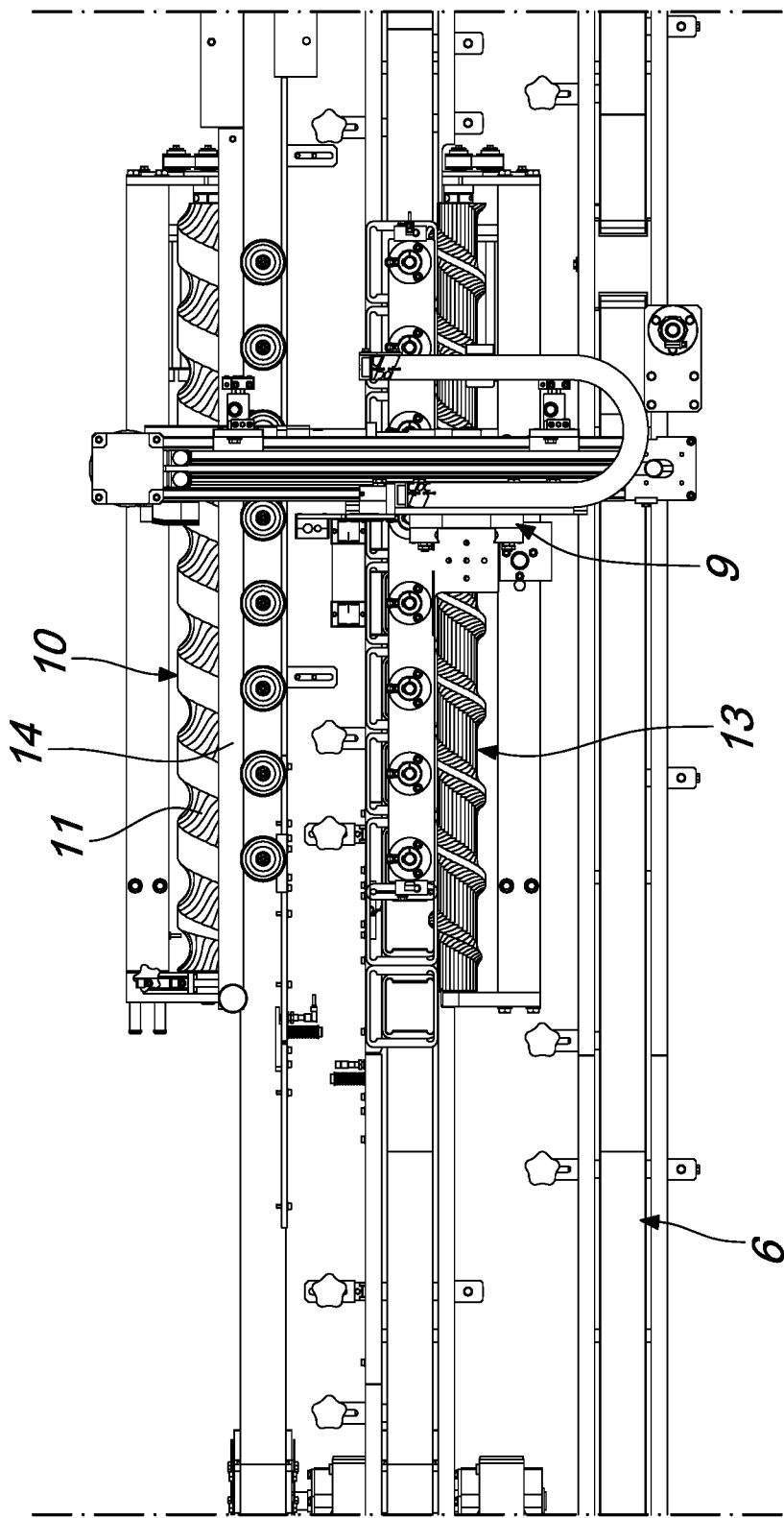


Fig. 2a

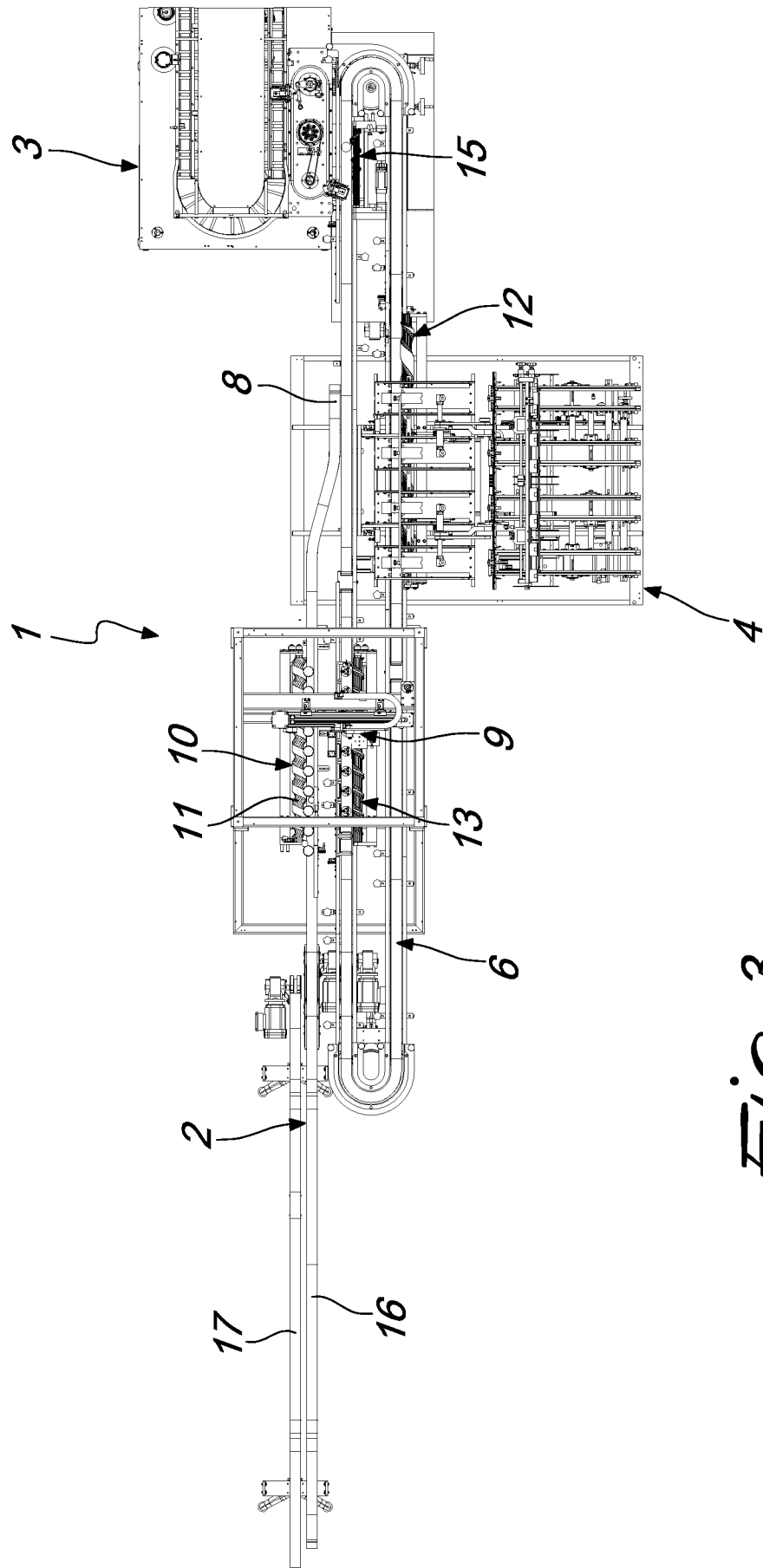


Fig. 3

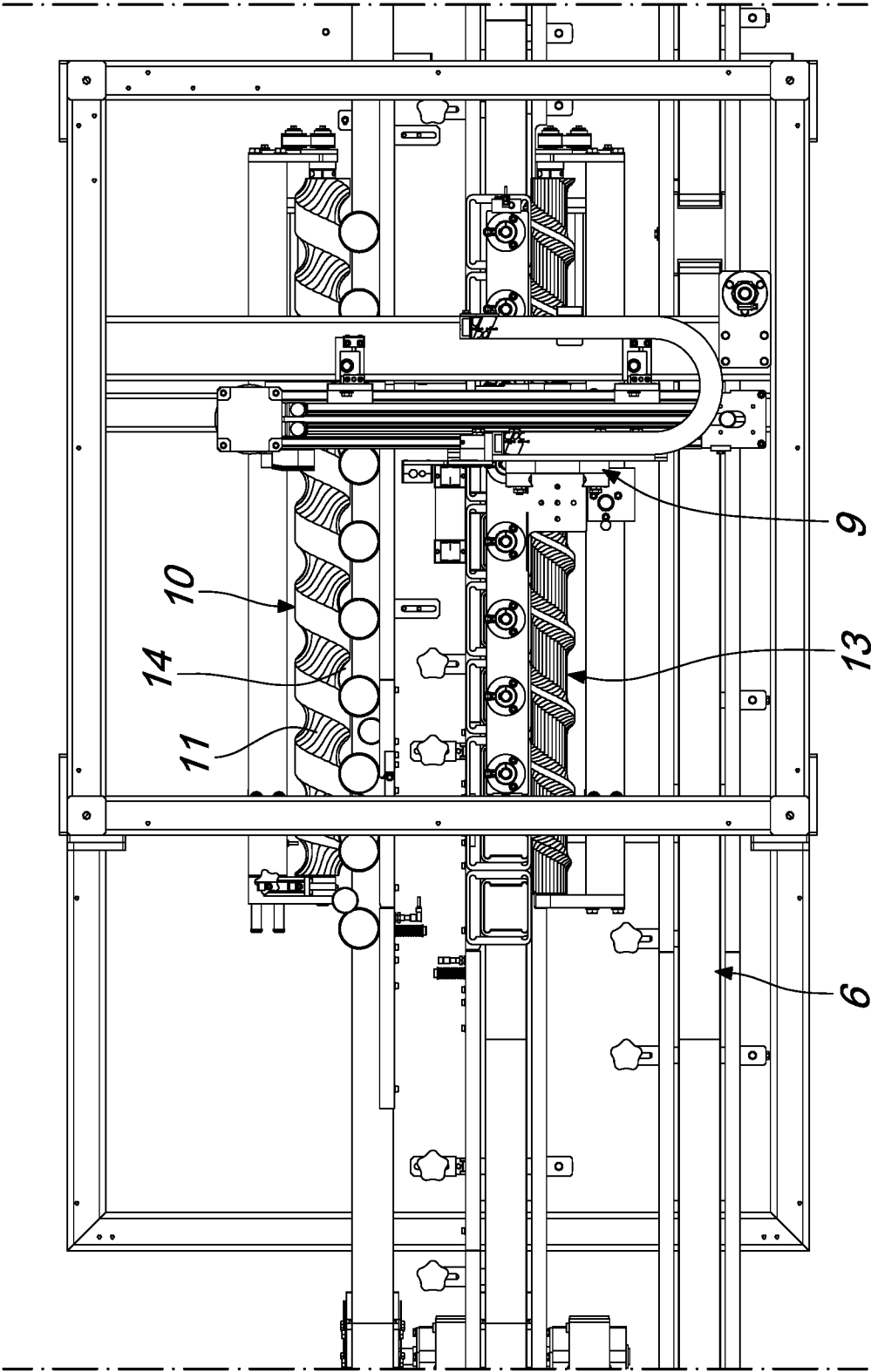


Fig. 3a

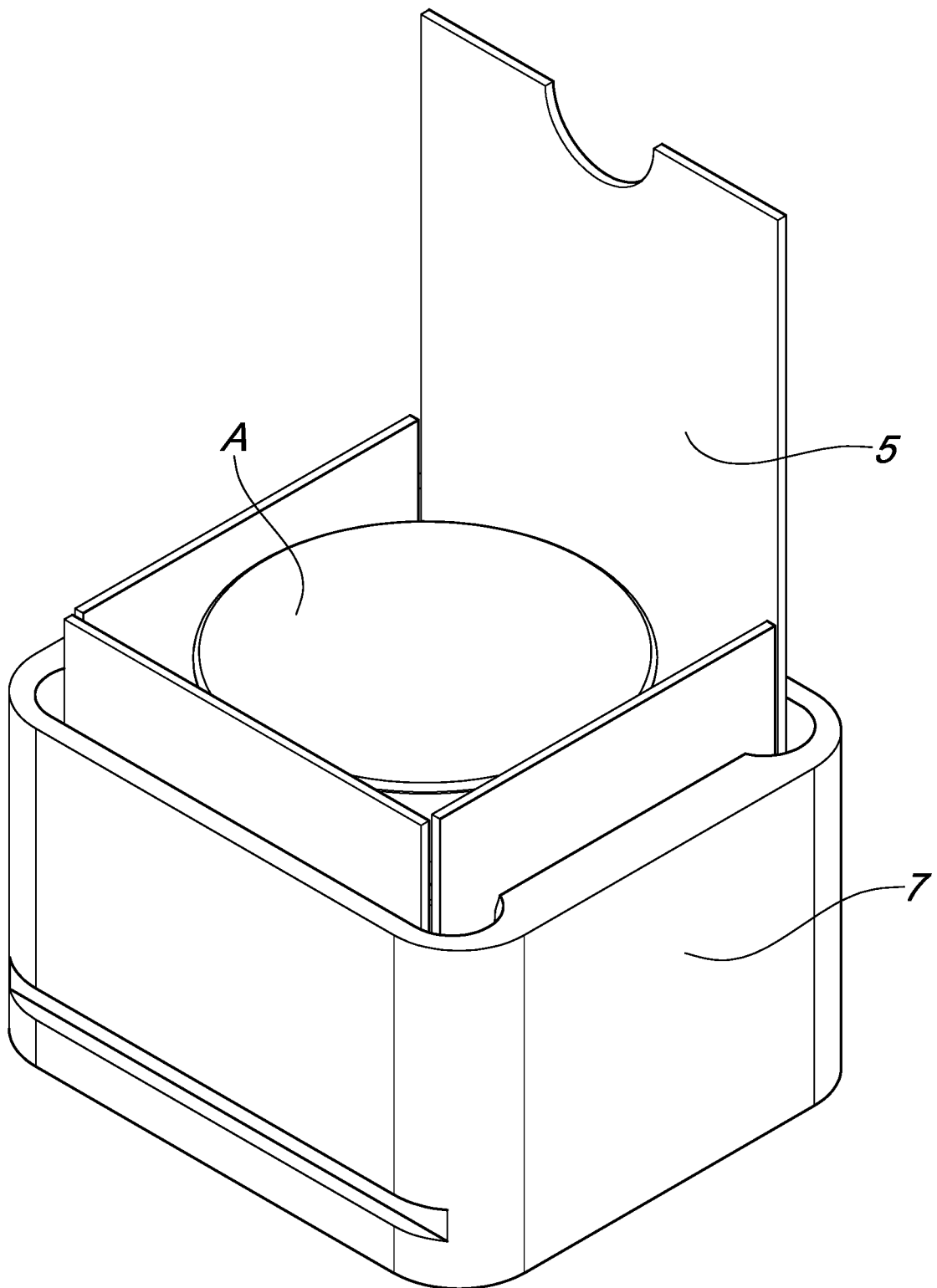


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/082714

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65B65/00 B65B5/02 B65B5/04 B65B21/12 B65B21/18
B65B35/18 B65B35/24 B65B43/44 B65B59/04
ADD. B65B47/06

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)

B65B B65G B67C

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)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	US 2010/293891 A1 (LAMAMY MICHEL [FR]) 25 November 2010 (2010-11-25) the whole document -----	1-10
A	US 2014/305075 A1 (BONNAIN JEAN-CHRISTOPHE [FR]) 16 October 2014 (2014-10-16) figure 3 -----	1
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A	US 4 350 002 A (FOCKE HEINZ H) 21 September 1982 (1982-09-21) figures 1-4 -----	1



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

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Date of mailing of the international search report

23/02/2017

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

Authorized officer

Cardoso, Victor

INTERNATIONAL SEARCH REPORT

Information on patent family members

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