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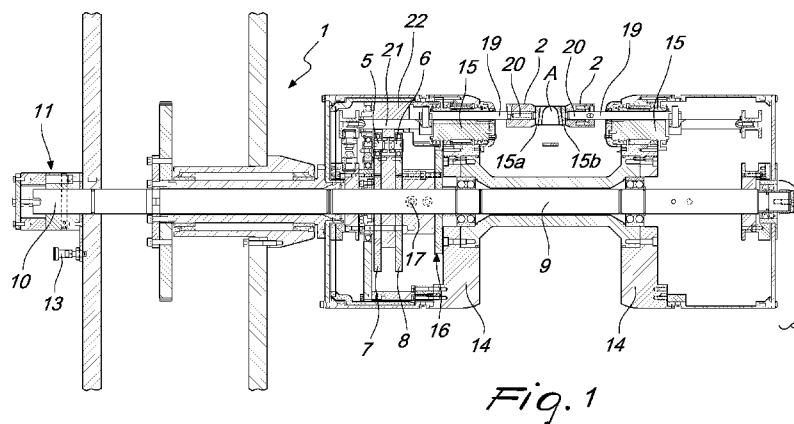
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(54) Title: ADJUSTMENT ASSEMBLY FOR PACKAGING MACHINES AND THE LIKE



(57) Abstract: An adjustment assembly (1), for packaging machines and the like, which comprises grip means (2) for picking up one product (A) at a time from a line (3) for supplying queued products (A) and for transferring to a respective processing station (4); the grip means (2) are rotatable and are functionally associated, for their orientation and for the orientation of the product (A) retained by them, with at least one respective probe (5, 6) which can slide on at least one profiled cam (7, 8) that is fixed; the translations of the at least one probe (5, 6) generate rotations of the grip means (2) with consequent modification of the orientation of the product (A) retained between them for correct delivery to the subsequent processing station (4).

ADJUSTMENT ASSEMBLY FOR PACKAGING MACHINES AND THE LIKE

The present invention relates to an adjustment assembly for packaging machines and the like; such assembly can be particularly indicated for the adjustment of machines for the individual packaging of small products.

In particular the products can be candies, chocolates, pastries, chocolate shapes and the like, i.e. products that are delicate and easily subjected to deformations and wear when handled. The possibility is not excluded of also applying the present invention to machines intended for packaging products of a different nature.

The individual packaging of products consists of picking them up from a supply line and wrapping them with flaps of paper-like or polymeric material, or with sheets, generally multi-layer, provided with a thin layer of aluminum.

The packaging can occur by adopting substantially three different wrapping methods (from which a plurality of intermediate and derived solutions can be identified).

The wrapper can be folded on the product, according to predefined folding lines so that the overlapping flaps of the sheet are in turn made to fit together with one of the surfaces of the product which is contiguous thereto. This is a type of wrapping used for chocolates that are predominantly prismatic or more generally polyhedral in shape.

According to a further implementation, the wrapping can be done by wrapping the product and producing two twists with the sheet at the two opposite ends of the product.

This form of wrapping, which in the trade is known as "double twist" (and substantially shaped like a bonbon or Christmas cracker), is particularly indicated for products that are spherical, cylindrical, ellipsoid and the like.

A third type of wrapping comprises flaps superimposed and folded on one side, and a twist on the opposite side.

This third form of wrapping, which in the trade is known as "single twist", is particularly indicated for axially-symmetrical products provided
5 with a substantially flat base.

The main problem suffered in conventional wrapping apparatuses, for the above mentioned products, is linked to the necessity of picking up the product from the supply line in order to be able to manipulate it, orienting it and covering it with the respective wrapper.

10 In fact the picking up transfers the product, which comes by translation from a supply line, onto a manipulation drum in which the product will follow a substantially circular path.

It is thus necessary that specific grip means, which are integral with the rotating drum, grip the product while it performs a translational motion
15 on the supply line.

The delivery to the subsequent station, where the actual wrapping of each individual product will be carried out, must occur with an orientation of the product that is such as to allow the wrapping according to the desired mode.

20 In fact it is essential that the product be arranged in such a manner as to allow a correct juxtaposition of the wrapping sheet and a closing thereof by way of fixed and/or movable flaps.

Conventional operating units that pick up and orientate the product are specifically dedicated to a particular type of wrapper.

25 The machine with which they are associated is thus adapted to carry out only one type of wrapping: the high costs and this low versatility make this type of machine viable only for extremely large-scale producers and/or for companies that need to always package a single type of product in the same way.

30 The aim of the present invention is to solve the above mentioned

drawbacks, by providing an adjustment assembly for packaging machines and the like which makes it possible to pick up a product from a supply line and deliver it to a processing station, giving it the correct orientation so that the processing station can carry out thereon the activity for which it is
5 designed.

Within this aim, an object of the invention is to provide an adjustment assembly for packaging machines and the like which makes it possible to select the orientation with which the product is delivered to the processing station.

10 Another object of the invention is to provide an adjustment assembly for packaging machines and the like which makes it possible to increase the versatility of the machine in which it is installed.

Another object of the present invention is to provide an adjustment assembly for packaging machines and the like which is low cost, easily and
15 practically implemented and safe in use.

This aim and these and other objects that will become better apparent hereinafter, are achieved by an adjustment assembly for packaging machines and the like, of the type comprising grip means for picking up one product at a time from a line for supplying queued products and for transferring to a
20 respective processing station, characterized in that

- said grip means are rotatable and are functionally associated, for their orientation and for the orientation of the product retained by them, with at least one respective probe which can slide on at least one profiled cam that is substantially fixed, the translations of said at least one probe
25 generating rotations of said grip means with consequent modification of the orientation of the product retained between them for correct delivery to the subsequent processing station,

- said at least one cam is integral with a fixed axis, the head of said axis being associated with a respective movement element for the controlled
30 rotation of said axis according to at least two different arrangements, which

correspond to different rotated configurations of said cams, with consequent different variation of the orientation of the product along the path, when said product is retained by said grip means after its clamping,

- said cams are mutually complementary, each cam having a contoured edge that defines, in contiguous sectors, different paths for said at least one probe, which correspond to different variations of the orientation of the product along the path after the pickup of each individual product from said supply line.

Further characteristics and advantages of the invention will become better apparent from the description of a preferred, but not exclusive, embodiment of the adjustment assembly for packaging machines according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a cross-sectional side view taken along a longitudinal vertical plane of a machine for packaging and the like, which is provided with an adjustment assembly according to the invention;

Figure 2 is a schematic front elevation view of a portion of a machine for packaging and the like, which is provided with an adjustment assembly according to the invention;

Figure 3 is a front elevation view of a detail of the portion of the machine in Figure 2;

Figure 4 is a perspective view of a carousel associated with an adjustment assembly for packaging machines and the like according to the invention;

Figure 5 is a side view of the carousel in Figure 4.

With reference to the figures, the reference numeral 1 generally designates an adjustment assembly for packaging machines and the like.

It should be noted that the generic nature of the type of adjustment selected makes it possible to also apply the assembly 1 to machines intended for performing activities that are entirely different to packaging.

The adjustment assembly 1, for packaging machines and the like, comprises grip means 2 for picking up one product A at a time from a line 3 for supplying queued products A and for transferring to a respective processing station 4.

5 The grip means 2 are rotatable and functionally associated, in order to be capable of being effectively orientated according to the operating need of the subsequent station 4 (in particular the station 4 must receive the product A held by the means 2 according to a specific orientation that makes it possible to handle it correctly), with at least one respective probe 5 and 6
10 that can slide on at least one substantially fixed profiled cam 7 and 8.

According to the invention, the translations of the at least one probe 5 and 6 generate rotations of the grip means 2 with consequent modification of the orientation of the product A that is retained between them for correct delivery to the subsequent processing station 4.

15 In essence, the particular shape structure of the at least one cam 7 and 8 imposes a translation on the probe 5 and 6 which results in a rotation through a predefined angle of the grip means 2: this means that a product A taken from the line 3 with a specific spatial (geometric) orientation will be delivered to the station 4 rotated by such predefined angle in order to allow
20 the correct operation of the station 4.

It should be noted that, according to a particular embodiment of undoubted applicative interest, the at least one cam 7 and 8 is integral with a fixed axis 9.

25 The head 10 of the axis 9 is associated with a respective movement element 11 for the controlled rotation of the axis 9 according to at least two different arrangements, which correspond to different rotated configurations of the cams 7 and 8, with consequent different variation of the orientation of the product A along a path 12, when the product A is retained by the grip means 2 after its clamping.

30 It should be noted that, during the operation of the machine for

packaging and the like with which the assembly 1 is associated, the axis 9 is fixed (component usually static) and the cams 7 and 8 are also fixed with it.

The cams 7 and 8 are mutually complementary; each cam 7 and 8 is provided with a contoured edge which defines, in contiguous sectors,
5 different paths for the at least one probe 5 and 6.

Such different paths correspond to different variations of the orientation of the product A along the path 12, after the picking up of each individual product A from the supply line 3.

It should further be noted that the cams 7 and 8 comprise a plurality
10 of contiguous sectors of predefined angular extent.

Such sectors are provided with an edge with a contour that is curved according to a predefined rule of motion: the movement of the probe 5 and 6, along the respective edges of each sector, thus produce a different orientation of the product A upon delivery to the processing station 4.

15 According to the type of operations that are to be carried out by the station 4, and/or according to the different nature of the station 4 arranged downstream of the assembly 1, the operator can decide, simply by way of a rotation of the axis 9 (and with it of the cams 7 and 8), the orientation of the product A at the moment of delivery to the station 4.

20 Thus it can be seen that the assembly 1 is capable of conferring great versatility on the machine that comprises it, making it adapted to work with different processing stations 4 and/or with a processing station 4 that is capable of executing different operations that imply the reception of the product A with different orientations.

25 According to a specific embodiment of the present invention, the movement element 11 comprises at least one grip handle and at least one locking unit 13, for retaining the axis 9 according to a plurality of different configurations.

The locking unit 13, in a particularly simple version thereof (shown
30 for the purposes of non-limiting example in Figure 1), can be constituted by

a pin that is elastically forced on a plurality of contiguous seats of a fixed casing: retraction of the pin, by forcing the elastic means, allows the free rotation of the axis 9 with respect to the casing. Once such rotation is executed, the pin, by the action of the aforementioned elastic means, will be
5 pushed anew into one of the seats of the casing (locking the axis 9 anew in such rotated configuration).

According to this embodiment, an operator, after disabling the locking unit 13, can act manually on the grip handle in order to rotate the axis 9 integrally with the at least one cam 7 and 8.

10 At the end of the rotation the probes 5 and 6 will be aligned (in their useful travel for picking up and transferring to the station 4) with a different sector of a respective cam 7 and 8.

According to an embodiment that is an alternative to the previous one and is completely automated, the adoption is not ruled out of a movement
15 element 11 that comprises at least one actuator and at least one locking unit 13, for retaining the axis 9 according to a plurality of different configurations. In such case the actuator and the unit 13 will be controlled by a respective management and control unit for disabling the locking unit 13 (and freeing the rotation of the axis 9). The rotation of the axis 9,
20 integrally with the at least one cam 7 and 8, will be imposed by the actuator for an angle of predefined extent. Thereafter the locking unit 13 is subsequently re-enabled, when rotation is completed.

In a possible application of the invention on a machine designed for packaging individual products A, it should be noted that such machine can
25 preferably comprise a pair of mutually opposite carousels 14 that are coaxial and which rotate synchronously.

Each carousel 14 supports at least two grip means 2, which are distributed angularly along the carousel 14 and are aligned with corresponding grip means 2 of the other carousel 14.

30 The grip means 2 are articulated to a toothed planetary gear 15 that is

accommodated in the carousel 14 and is rotatable on a fixed toothed sun gear 16 of the carousel 14.

The sun gear 16 is coupled rigidly to the axis 9 by way of an element 17 (of the type of a pin, a screw, a key and the like).

5 The grip means 2 are pivoted eccentrically on each planetary gear 15, defining a path 12 that has a portion 18 that is inclined and divergent with respect to the supply line 3.

The portion 18 is arranged downstream of the area for the clamping of the product A by the grip means 2.

10 It should be noted that the grip means 2 comprise a supporting shaft 19 for their first end 20 which is intended to clamp the product A.

The shaft 19 is translatable for the mutual approach and spacing apart of the ends 20 of mutually opposite and aligned means 2, with consequent clamping and releasing of the product A.

15 With particular reference to the embodiment illustrated previously, the shaft 19, substantially at its second end 21, which is opposite to the first end 20, will be effectively coupled to the at least one probe 5 and 6 that can slide along the at least one cam 7 and 8.

20 It should be noted that in reality the shaft 19 is constituted by two parallel and non-aligned rods, one of which is arranged axially with respect to the corresponding planetary gear 15, in particular this is the rod that is integral with the second end 21, and the other one is misaligned and eccentric with respect to the corresponding planetary gear 15 (the rod corresponding to the first end 20).

25 If the two rods were aligned and both coaxial with the axis of the corresponding planetary gear 15 they could define a single shaft 19 (made of a single piece), but in such case the grip means 2 would not move along the preset path 12.

30 The probes 5 and 6 are two in number, provided with an idle end roller intended to abut against the lateral edge of a respective contoured cam

7 and 8.

Each pair of probes 5 and 6 is coupled to a bracket 22 that is associated with a respective shaft 19 of a respective grip means 2.

Thanks to the presence of the bracket 22 the movement of the probes
5 5 and 6 will always be synchronous and no unwanted rotation beyond limit will occur (the one constitutes a stroke limit, a guide, for the other, thus ensuring that the bracket 22 moves according to a predefined law of motion and, with it, the corresponding grip means 2).

Advantageously the present invention solves the above mentioned
10 problems, by providing an adjustment assembly 1 for packaging machines and the like which makes it possible to pick up a product A from a supply line and deliver it to a processing station 4, giving it the correct orientation so that the processing station 4 can carry out thereon the activity for which it is designed.

15 Conveniently the adjustment assembly 1 makes it possible to select the orientation with which the product A is delivered to the processing station 4.

Conveniently the adjustment assembly 1 thus makes it possible to increase the versatility of the machine in which it is installed.

20 Profitably, the assembly 1 is characterized by low cost and relatively simple practical implementation, a peculiarity that ensures its industrial application.

The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the
25 appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

30 In practice, the materials employed, as well as the dimensions, may be

any according to requirements and to the state of the art.

The disclosures in Italian Patent Application No. BO2014A000208 from which this application claims priority are incorporated herein by reference.

- 5 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. An adjustment assembly for packaging machines and the like, of the type comprising grip means (2) for picking up one product (A) at a time from a line (3) for supplying queued products (A) and for transferring to a
5 respective processing station (4), characterized in that

- said grip means (2) are rotatable and are functionally associated, for their orientation and for the orientation of the product (A) retained by them, with at least one respective probe (5, 6) which can slide on at least one profiled cam (7, 8) that is substantially fixed, the translations of said at least
10 one probe (5, 6) generating rotations of said grip means (2) with consequent modification of the orientation of the product (A) retained between them for correct delivery to the subsequent processing station (4),

- said at least one cam (7, 8) is integral with a fixed axis (9), the head (10) of said axis (9) being associated with a respective movement element
15 (11) for the controlled rotation of said axis (9) according to at least two different arrangements, which correspond to different rotated configurations of said cams (7, 8), with consequent different variation of the orientation of the product (A) along the path (12), when said product (A) is retained by said grip means (2) after its clamping,

20 - said cams (7, 8) are mutually complementary, each cam (7, 8) having a contoured edge that defines, in contiguous sectors, different paths for said at least one probe (5, 6), which correspond to different variations of the orientation of the product (A) along the path (12) after the pickup of each individual product (A) from said supply line (3).

25 2. The adjustment assembly according to claim 1, characterized in that said cams (7, 8) comprise a plurality of contiguous sectors having a predefined angular extent, said sectors being provided with an edge with a contour that is curved according to a predefined rule of motion, the movement of said probe (5, 6) along the respective edges of each sector
30 producing a different orientation of the product (A) upon delivery to said

processing station (4).

3. The adjustment assembly according to claim 1, characterized in that said movement element (11) comprises at least one grip handle and at least one locking unit (13) for retaining the axis (9) according to a plurality of
5 different configurations, an operator, after disabling said locking unit (13), by acting manually on said grip handle for the rotation of said axis (9) integrally with said at least one cam (7, 8), being able to arrange the axis (9) according to the rotated configuration of interest.

4. The adjustment assembly according to claim 1 or to claim 3,
10 characterized in that said movement element (11) comprises at least one actuator and at least one locking unit (13), for retaining the axis (9) according to a plurality of different configurations, said actuator and said unit (13) being controlled by a respective control and management device for disabling said locking unit (13), for the rotation of said axis (9)
15 integrally with said at least one cam (7, 8) and for the subsequent re-enabling of said locking unit (13) when rotation is completed.

5. The adjustment assembly according to claim 1, characterized in that it comprises a pair of mutually opposite carousels (14) which are coaxial and rotate synchronously, each carousel (14) supporting at least two grip
20 means (2), which are distributed angularly along said carousel (14) and are aligned with corresponding grip means (2) of the other carousel (14), said grip means (2) being articulated to a toothed planetary gear (15) that is accommodated in said carousel (14) and can rotate about a fixed toothed sun gear (16) of said carousel (14), said grip means (2) being pivoted
25 eccentrically on each planetary gear (15), defining a path (12) that has a portion (18) that is inclined and divergent with respect to said supply line (3), said portion (18) being arranged downstream of the area for the clamping of said product (A) by said grip means (2).

6. The adjustment assembly according to claim 5, characterized in that
30 said grip means (2) comprise a supporting shaft (19) for their first end (20)

which is intended to clamp the product (A), said shaft (19) being translatable for the mutual approach and spacing apart of the ends (20) of mutually opposite and aligned means (2), with consequent clamping and releasing of the product (A).

5 7. The adjustment assembly according to one or more of the preceding claims, characterized in that said shaft (19), at its second end (21), which is opposite said first end (20), is coupled to the at least one said probe (5, 6) that can slide along said at least one cam (7, 8).

10 8. The adjustment assembly according to claim 7, characterized in that said probes (5, 6) are two in number and are provided with an idle end roller that is intended to abut against the lateral edge of a respective contoured cam (7, 8), each pair of probes (5, 6) being coupled to a bracket (22) that is associated with a respective shaft (19) of a respective grip means (2).

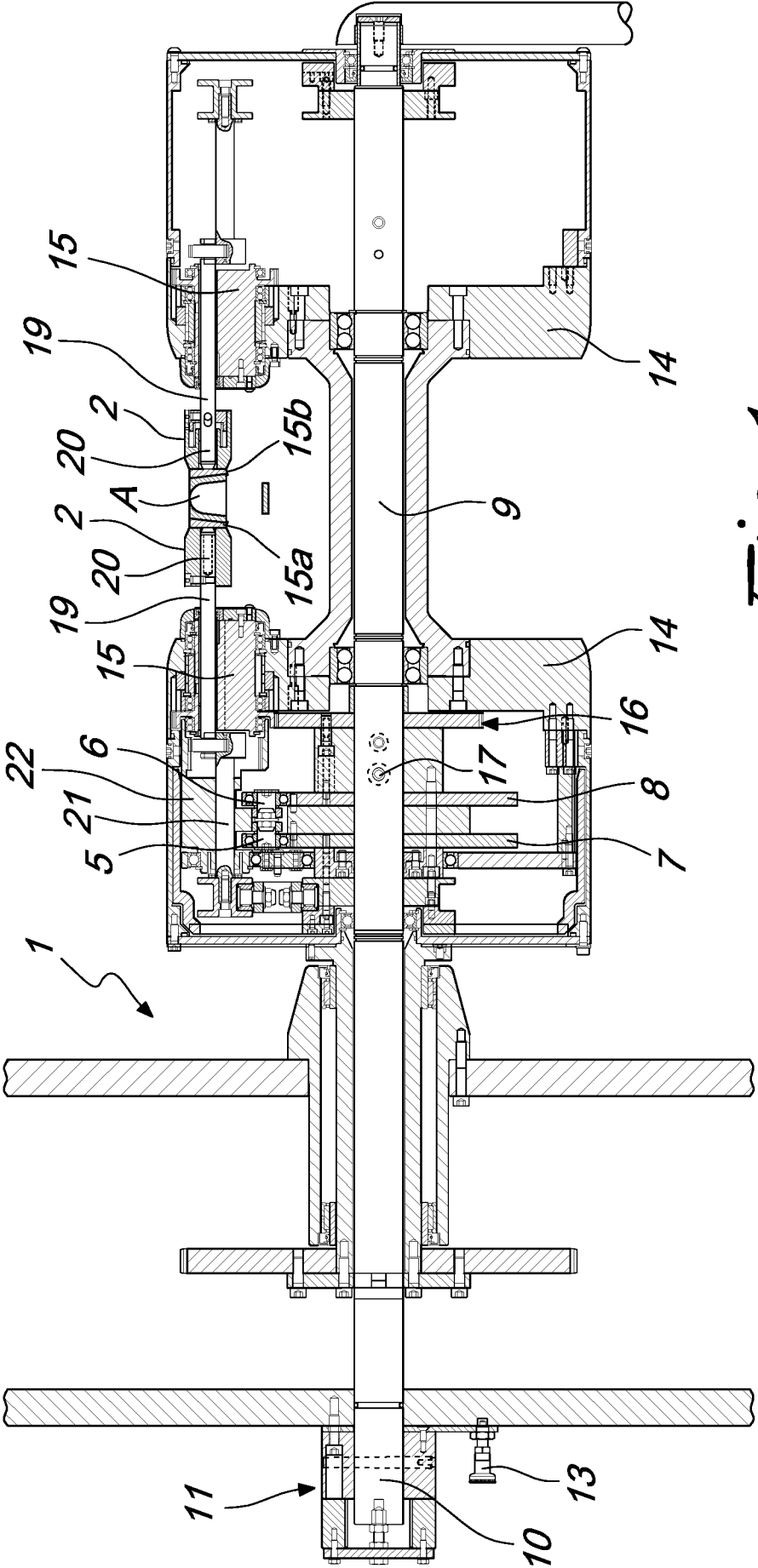


Fig. 1

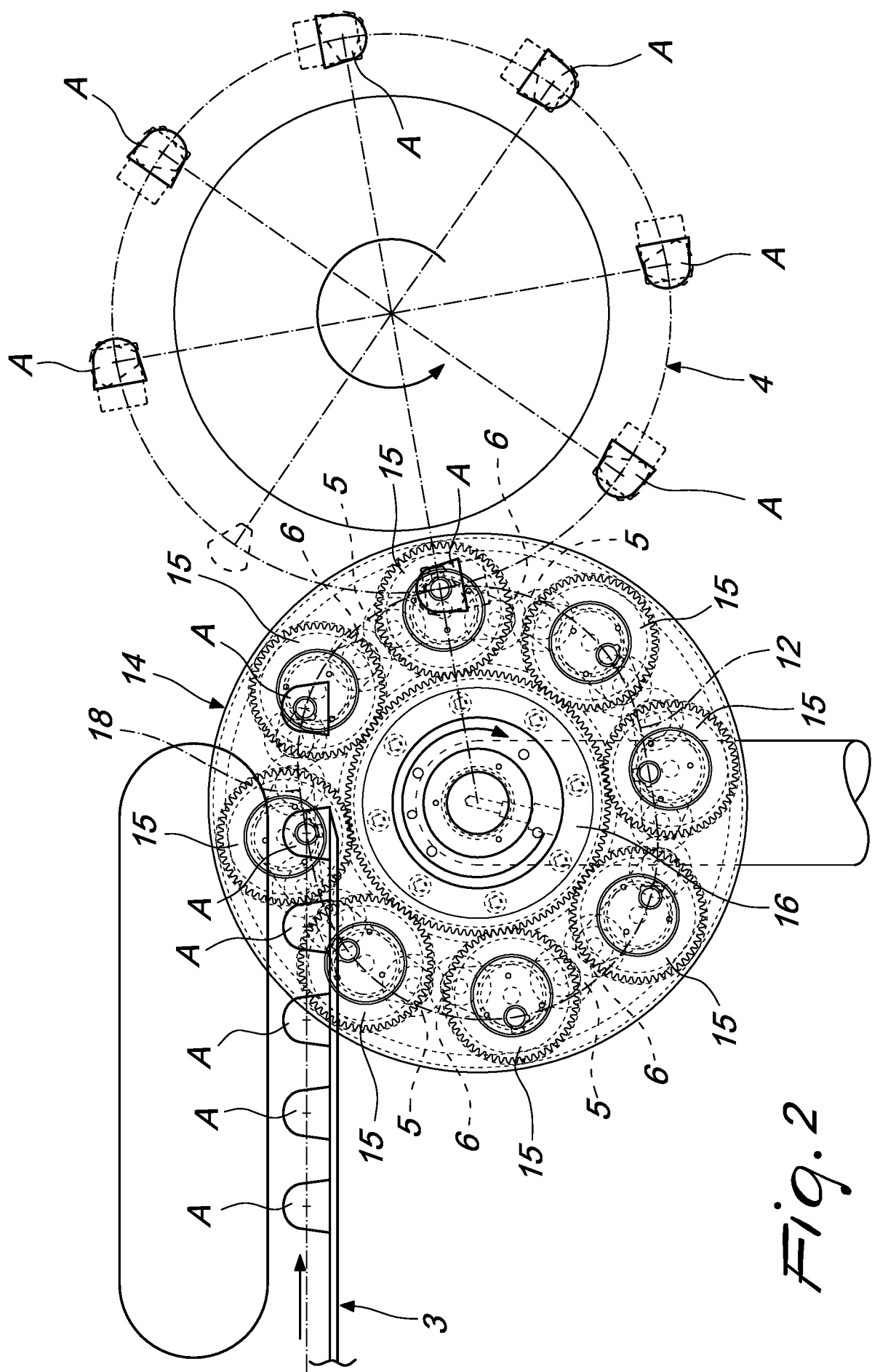


Fig. 2

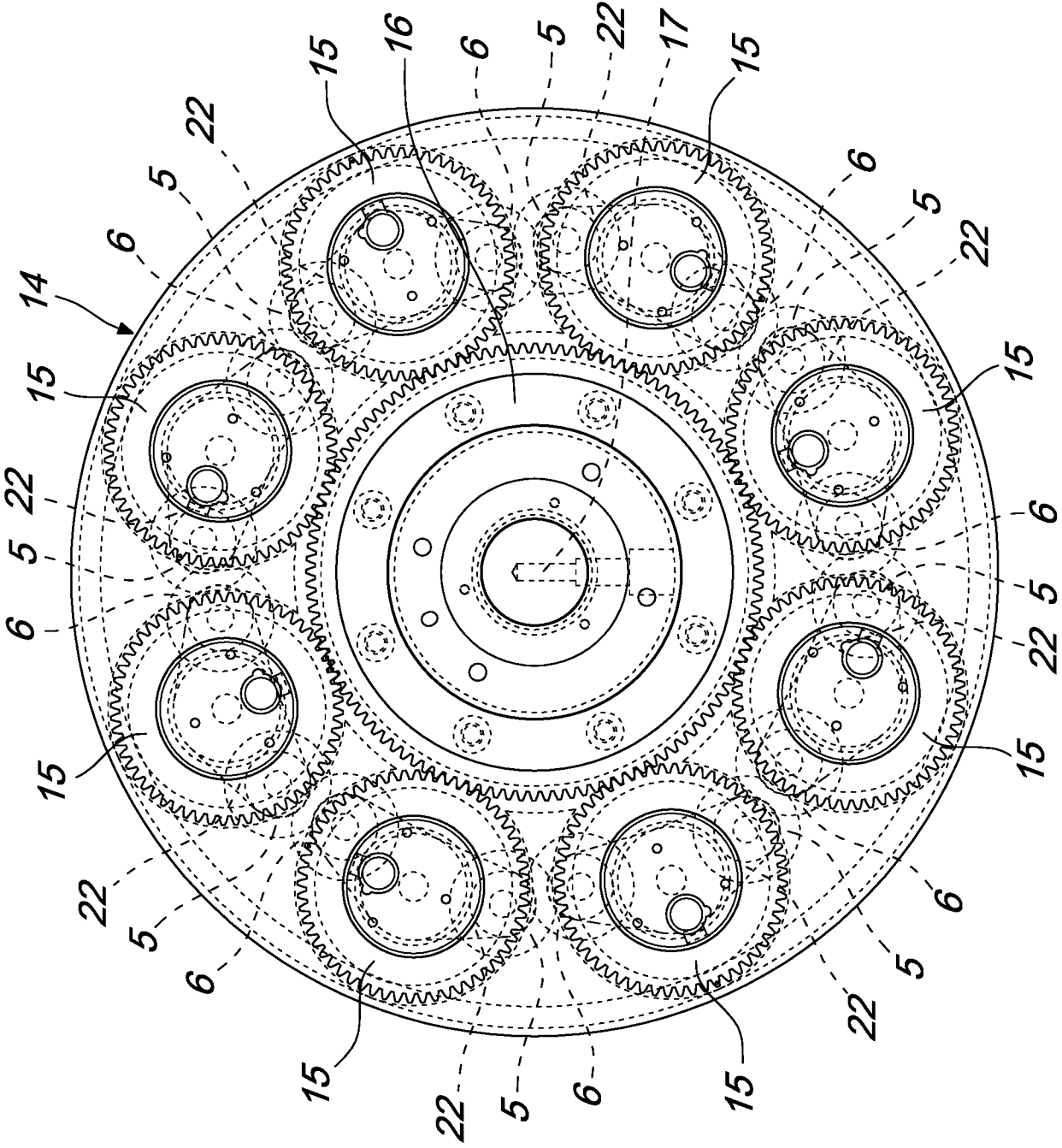


Fig. 3

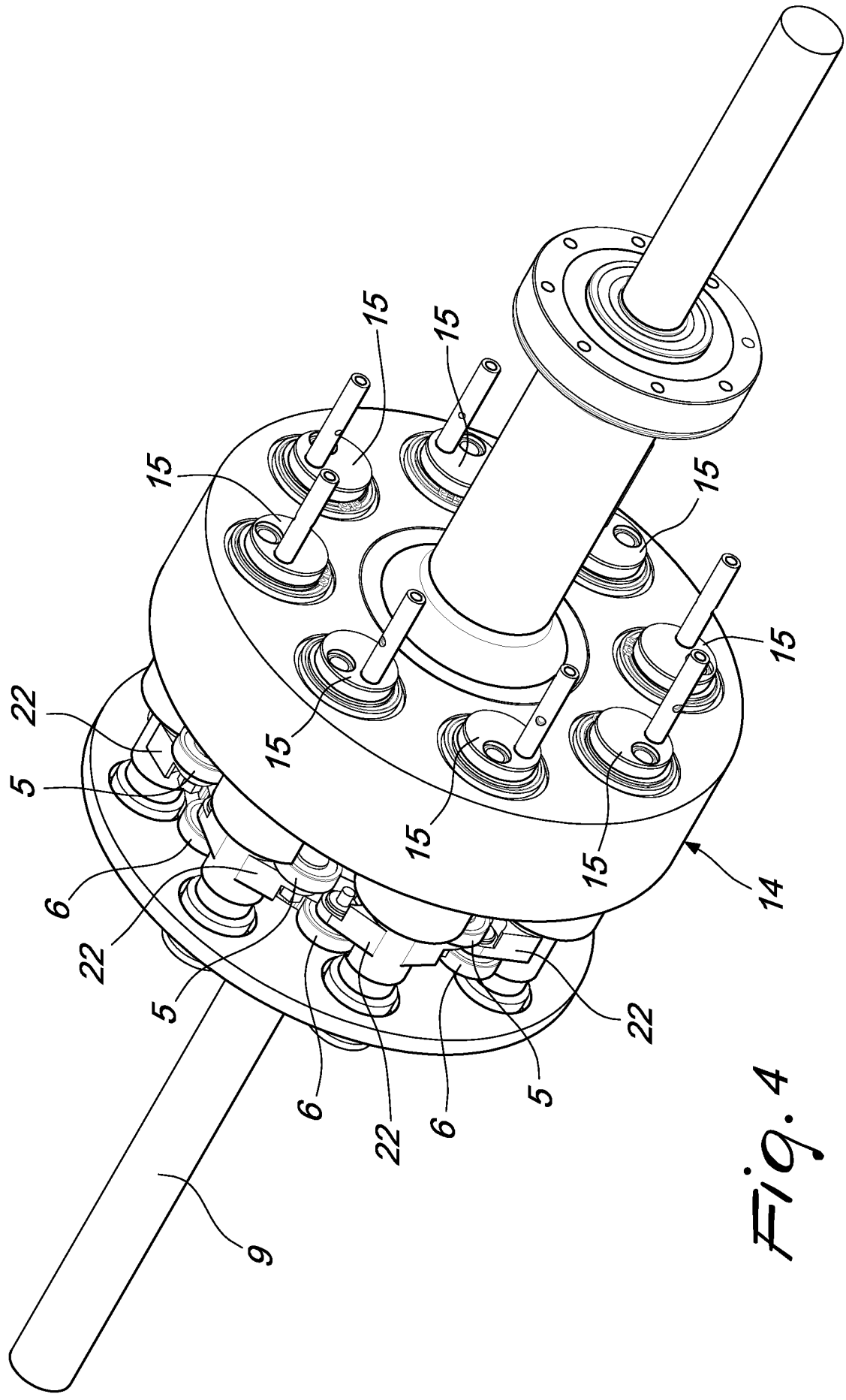


Fig. 4

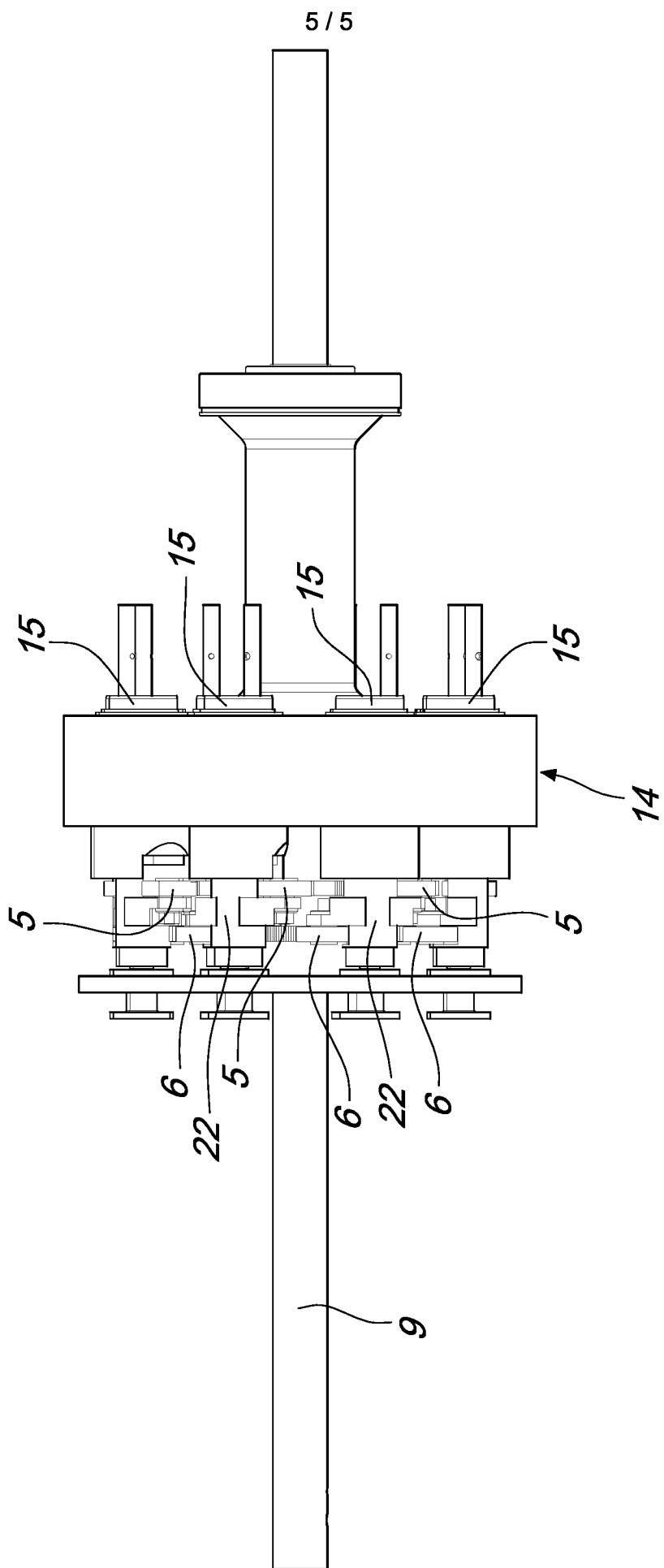


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/057693

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65B29/00 B65B35/26 B65B35/56 B65G47/84 B65G47/86
B65B11/00 B65B59/02

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)

B65B 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, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	WO 03/082675 A1 (CARLE & MONTANARI SPA [IT]; FRABETTI FABIO [IT]; BARALDI LUCA [IT]; GI) 9 October 2003 (2003-10-09) the whole document -----	1
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A	EP 0 801 014 A1 (AZIONARIA COSTRUZIONI ACMA SPA [IT]) 15 October 1997 (1997-10-15) the whole document ----- -/-	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"P" document published prior to the international filing date but later than the priority date claimed

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Date of the actual completion of the international search

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14/07/2015

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2015/057693

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2 415 997 A (ELDRED JOHN W) 18 February 1947 (1947-02-18) the whole document -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

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