



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.04.2017 Bulletin 2017/17

(51) Int Cl.:
E05D 15/24 ^(2006.01) **G05B 19/00** ^(2006.01)
B21D 28/00 ^(2006.01)

(21) Application number: **16193262.9**

(22) Date of filing: **11.10.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **Condoor Group B.V.**
3899 AA Zeewolde (NL)

(72) Inventor: **Kwant, Jacob**
3853 LH Ermelo (NL)

(74) Representative: **Klavers, Cornelis**
Octroibureau Klavers B.V.
P.O. Box 1642
1300 BP Almere (NL)

(30) Priority: **19.10.2015 NL 2015631**

(54) **METHOD OF MANUFACTURING RAIL SYSTEM PROFILES**

(57) A description is given of a method in which profiles which are to be assembled for a rail system which is suitable for guiding movable doors are selected from the following profiles: a) at least one reinforcement profile having a minimum length and a maximum length and provided with fixing holes, and manufacturable discrete profile lengths to be selected in between said minimum length and said maximum length; and b) at least one runner profile having a minimum length and a maximum length and provided with fixing holes, and manufacturable discrete runner profile lengths to be selected in between said minimum length and said maximum length;

and c) at least one mounting profile having a minimum length and a maximum length and provided with fixing holes for the reinforcement profile and/or the runner profile, and manufacturable discrete mounting profile lengths to be selected in between said minimum length and said maximum length; and at least one bend profile having a minimum bending angle and a maximum bending angle and provided with fixing holes for the runner profile, and manufacturable discrete bending angles to be selected in between said minimum bending angle and said maximum bending angle.

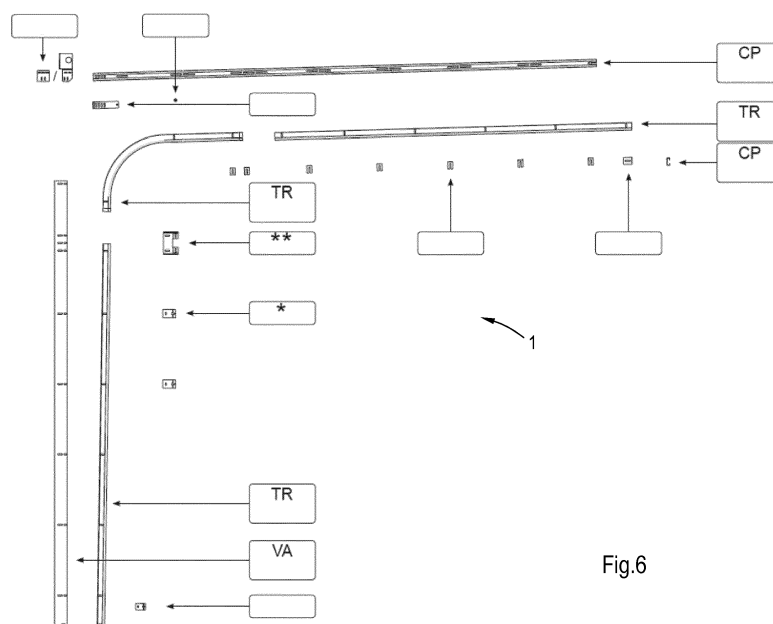


Fig.6

Description

[0001] The present invention relates to a method in which profiles which are to be assembled are selected for the manufacture of a rail system which is suitable for guiding movable doors, such as garage doors or overhead doors.

[0002] The present invention also relates to a computer program which is suitable for implementing said method.

[0003] Such a method frequently implies that the profiles required for assembling such a rail system are selected and, if required, adapted at the worksite. For this purpose, tools among other things are necessary at the client site where the rail system is built up to cut various reinforcement profiles, runner profiles and mounting profiles, as well as bend profiles having a specific bending angle, to the desired lengths. In addition, a punching unit comprising guiding means and stops, is required at the client site to form fixing holes in said profiles at the desired locations, as well as a workbench or an assembly table.

[0004] It is an object of the present invention to provide an improved method, which enables rail systems for doors, such as overhead doors, to be assembled and installed at the work site, while requiring a minimum of stock, tools, operations and keeping cutting losses to a minimum.

[0005] To achieve this, the method according to the invention has the characteristics of claim 1.

[0006] Surprisingly, by using the individual profiles mentioned in said claim, each having discrete lengths or bending angles dependent upon the profile type, every required rail system can be manufactured in practice. If necessary, individual profiles can be extended to meet the required size. This means that it becomes possible to prefabricate complete profile packages having predetermined discrete dimensions, in particular length dimensions, which require no or minimal processing, such as for bringing them to the required length or providing them with apertures, at the work site where the rail system is installed. By virtue thereof, the loss of profile material in the cutting process as well as the necessary tools are reduced to a minimum, but also the assembly time at the client site, which is often considered to be unpleasant, is minimized.

[0007] An embodiment of the method according to the invention is characterized in that at least the fixing holes at, and with respect to, the two end portions of the reinforcement profile (CP) and/or the runner profile (TR) and/or the mounting profile (VA) are provided in corresponding positions.

[0008] Advantageously, these profiles thus are symmetrical and always can be readily interconnected and secured to one another, leading to still fewer handling operations in situ.

[0009] A further embodiment of the method according to the invention is characterized in that input data for the required rail system are supplied to a computer program, such as internal width (DMB), internal height (DMH), se-

lection of the rail system, i.e., a normal, high, or low system which may or may not follow a roofline, or which is a vertical system, or which is a system which follows the roofline at a specific angle, on the basis of which data and taking account the abovementioned available, individual profiles (CP; TR; VA; BP), output data are generated by the computer program regarding the profiles (CP; TR; VA; BP) to be actually manufactured, the profile lengths, the position of the fixing holes to be punched and of the bending angles, and these data are provided as an overview.

[0010] Based on the necessary input data, manufacturing machines are set for the actual manufacture of these profiles specified by the program. The combination of the profiles thus prefabricated forms a package on the basis of which, apart from a few accessories, the rail system can be assembled and installed in situ by an installer or handy do-it-yourselfer.

[0011] Further detailed, possible embodiments, which are set forth in the remaining claims, are mentioned together with the associated advantages in the following description.

[0012] The method according to the present invention will now be explained in greater detail with reference to the figures mentioned below, in which corresponding components are indicated by the same reference numerals. In the figures:

Figures 1a, 2a, 3a and 4 show representations of each of the profiles CP; TR; VA; BP provided with corresponding fixing holes, said profiles having discrete lengths and bending angles, as used in the method according to the invention;

Figures 1b and 1c, 2b and 2c, 3b and 3c show possible patterns of the fixing holes at, respectively, the beginning and the end of the profiles CP, TR, VA shown in the preceding figures, and

Figure 5 shows a flowchart to elucidate the operation of the computer program which can be used to implement the method according to the invention; and Figures 6, 7 and 8 show three examples of diagrammatically represented rail systems whose profiles and bends, in particular, are selected by applying the method according to the invention.

Figures 1a, 2a and 3a show, respectively, profiles CP, TR and VA having different discrete lengths, which in combination with bend profiles BP having different bending angles, shown in figure 4, can be used after selection to build up a rail system 1 which is suitable for guiding movable doors therein, such as tilt-up doors, for example garage doors or overhead doors. An individual reinforcement profile CP provided with fixing holes has a minimum length and a maximum length and, between said extremes, discrete profile lengths which can be selected and manufactured. The same applies to the individual runner profile TR provided with fixing holes and to the individual mounting profile VA. As regards the individual

bend profile BP, a selection between a minimum bending angle of 0 degrees and a maximum bending angle of, in the case shown, 35 degrees is possible. Alternatively, bend profiles with intermediate discrete bending angle values can be selected. By coupling individual profiles, larger overall lengths can be bridged, if necessary.

[0013] In order to ensure that said profiles connect up with each other, the pattern of holes at the beginning, see details of figures 1b, 2b and 2c, and/or at the end, see details of figures 1c, 2c and 3c, of the lengths to be selected of the profiles CP, TR and VA, including those in the selected bend profile BG, must correspond to one another. In this manner, the profiles selected on the basis of profile types, profile lengths and bending angles, which profiles are to be prefabricated and then put together to form a package, can be screwed together in a simple manner at the worksite and subsequently secured to a column, girder, wall or ceiling. At the location where the beginning and/or the end of, for example, profile CP is to be screwed, or otherwise secured, to profile TR or bend profile BP, the respective holes or the hole pattern, that is to say the positions of the relevant holes, will correspond with one another and/or, if applicable, with holes in small plate material or mounting material. As explained hereinabove, this applies in particular at the beginning and the end of the profiles to be coupled together. Likewise, at locations where, for example, profile TR is to be mounted onto profile VA, the positions of the fixing holes in the respective profiles correspond with one another at least at said locations.

[0014] Because the reinforcement profile CP and/or the runner profile TR comprise rollers on either side of the relevant tilt-up door, which rollers should run in or on a track, said profiles usually are U- or C-shaped in cross section, wherein the track is enclosed.

[0015] The profiles CP, TR and/or VA can be symmetrical, in the sense that viewed with respect to a perpendicular bisecting line extending transversely to the longitudinal direction, the distribution of the fixing holes or the pattern of holes is equal on either side of said bisecting line. In this case, the combination of profiles is selected such that it does not matter which beginning or end of the profile is selected, because it always matches the neighbouring profile with which it is combined.

[0016] It has further been found that, in order to manufacture substantially all common rail systems, a limited number of lengths of individual profiles CP, TR and/or VA must be available in stock, in combination with a limited number of bend profiles BP having different bending angles. As a result:

- the reinforcement profile CP must have a minimum length of 2210 mm and/or a maximum length of 9200 mm, and/or
- the runner profile TR must have a minimum length of 1490 mm and/or a maximum length of 8490 mm,

and/or

- the mounting profile VA must have a minimum length of 2380 mm and/or a maximum length of 8880 mm.

[0017] It has however been found that this result can be further narrowed down without hampering the possibilities to find solutions to problems arising from existing situations and access apertures in constructions in which the rail system 1 with the respective overhead door can be installed.

[0018] Formulated mathematically for the sake of convenience, it was found that if:

- the reinforcement profile lengths to be manufactured extend in n steps from the minimum length to the maximum length, and/or
- the runner profile lengths to be manufactured extend in m steps from the minimum length to the maximum length, and/or
- the mounting profile VA lengths to be manufactured extend in p steps from the minimum length to the maximum length, and/or
- the manufacturable bending angles in the bend profile BG increase in t steps from the minimum bending angle to the maximum bending angle, and if it applies that
 - n is equal to 14, and/or
 - m is equal to 14, and/or
 - p is equal to 13, and/or
 - t is equal to 7,

then, in the sometimes unruly practical reality, this or these choices provide a satisfactory, on-site, solution to the practical manufacturing, mounting and installation problems in respect of the rail systems 1, without requiring large and time-consuming adaptations.

[0019] Based on the required profiles and profile lengths for the desired rail system 1, preferably, a selection from the abovementioned available profiles and profile lengths with symmetrical hole patterns at the end portions thereof is made in such a manner that the selected profile has to be sawn through only once. In this case, two profile halves suitable for the desired rail system are obtained without cutting waste and with only one saw cut.

[0020] In particular, as regards the profiles to be assembled, a selection is made from only the above-mentioned reinforcement profiles (CP), the runner profiles (TR), the mounting profiles (VA) and the bend profiles BP. This leads to more a uniform production process, so that the setting of the relevant automatically operating or programmable CNC machines is less time-consuming and the cost price per product is more competitive.

[0021] Based on the application of a computer program, input data of the desired rail system 1 to be manufactured is input into said program. Mention is made of the following input variables, which are determined on the basis of measurements, to be carried out in situ, particularly in the access aperture of the rail system. These

input variables are: internal width DMB, internal height DMH, the selected rail system, i.e., a normal, high, or low system which may or may not follow a roofline, or which is a vertical system, or which is a system which at least substantially follows the roofline at a specific angle. On the basis of the aforementioned variable and fixed data regarding available profiles CP; TR; VA; BP held in stock, output data are generated by the computer program regarding the selection of the specified combination of profiles to be actually manufactured, the profile lengths, the position of the fixing holes to be punched and of the bending angles. An overview, usually also on paper, of these data is provided.

[0022] Figure 5 shows a flowchart to explain the operation of a computer program which can be used to implement the method elucidated hereinabove. Reference numeral 2 indicates the start of the program, and at 3 the abovementioned necessary variables are input, which are used to calculate the necessary profile lengths at 4. At 5, the locations of the punch holes and the fixing holes are determined, which enables an optimization 7 of the sawing list, based inter alia on a possible limitation of the types of profiles held in stock 6. Next, at 8, a list of associated small parts is created, and at 9 and 10, overviews are generated regarding the sawing list, the punching list and the packing list for preparing the package, after which the program ends at 11. From 5 and 7, data can be transferred, if necessary, to automatically or not automatically operating machines in order to manufacture the required profiles. In fact, a band saw and a punching unit suffice to manufacture the required profiles on the basis of the above-mentioned lists. The package comprising the manufactured profiles, the composition of which has been selected by means of the computer program, can be transported to an installer or directly to a customer.

[0023] Figures 6 to 8 show three examples of diagrammatically represented rail systems 1, of which, in particular, the profiles CP, TR and VA indicated therein and bend profiles BG, are selected by applying the method explained hereinabove.

Claims

1. A method in which profiles which are to be assembled for a rail system which is suitable for guiding movable doors are selected from the following individual profiles:

- a) at least one first reinforcement profile (CP) having a minimum length and a maximum length and provided with fixing holes, and manufacturable discrete profile lengths to be selected in between said minimum length and said maximum length; and
- b) at least one runner profile (TR) having a minimum length and a maximum length and provided with fixing holes, and manufacturable discrete

crete runner profile lengths to be selected in between said minimum length and said maximum length; and

c) at least one mounting profile (VA) having a minimum length and a maximum length and provided with fixing holes for the reinforcement profile (CP) and/or the runner profile (TR), and manufacturable discrete mounting profile lengths to be selected in between said minimum length and said maximum length; and

d) at least one bend profile (BP) having a minimum bending angle and a maximum bending angle and provided with fixing holes for the runner profile (TR), and manufacturable discrete bending angles to be selected in between said minimum bending angle and said maximum bending angle.

2. The method according to claim 1, **characterized in that:**

- the reinforcement profile (CP) and/or
- the runner profile (TR)

are U- or C-shaped in cross section.

3. The method according to claim 1 or 2, **characterized in that** at least the fixing holes at, and with respect to, the two end portions of the reinforcement profile (CP) and/or the runner profile (TR) and/or the mounting profile (VA) are provided in corresponding positions.

4. The method according to any one of claims 1 to 3, **characterized in that:**

- the reinforcement profile (CP), and/or
- the runner profile (TR), and/or
- the mounting profile (VA),

viewed with respect to a perpendicular bisecting line extending transversely to the longitudinal direction, have a symmetrical distribution of the fixing holes, in particular at the location of the end portions of the profiles.

5. The method according to any one of claims 1 to 4, **characterized in that** the reinforcement profile (CP):

- has a minimum length of 2210 mm, and/or
- a maximum length of 9200 mm, and/or
- the reinforcement profile lengths to be manufactured can be manufactured in n steps, depending on the requirements, from the minimum length to the maximum length.

6. The method according to any one of claims 1 to 5,

characterized in that the runner profile (TR):

- has a minimum length of 1490 mm, and/or
- a maximum length of 8490 mm, and/or
- the runner profile lengths to be manufactured can be manufactured in m steps, depending on the requirements, from the minimum length to the maximum length.

7. The method according to any one of claims 1 to 6 **characterized in that** the mounting profile (VA):

- has a minimum length of 2380 mm, and/or
- a maximum length of 8880 mm, and/or
- the mounting profile lengths to be manufactured can be manufactured in p steps, depending on the requirements, from the minimum length to the maximum length.

8. The method according to any one of claims 1 to 7, **characterized in that** bend profile (BP):

- has a minimum bending angle of 0 degrees, and/or
- a maximum bending angle of 35 degrees, and/or
- the manufacturable bending angles of the bend profile can be manufactured in t steps, depending on the requirements, from the minimum bending angle to the maximum bending angle.

9. The method according to any one of claims 5 to 8, **characterized in that**:

- n is equal to 14, and/or
- m is equal to 14, and/or
- p is equal to 13, and/or
- t is equal to 7.

10. The method according to any one of claims 1 to 9, **characterized in that** with respect to the profiles to be assembled, or extended if necessary, a selection can be made from only the above-mentioned reinforcement profiles (CP), the runner profiles (TR), the mounting profiles (VA) and the bend profiles (BP).

11. A method according to any one of the preceding claims, wherein input data for the required rail system are supplied to a computer program, such as internal width (DMB), internal height (DMH), selection of the rail system, i.e., a normal, high, or low system which may or may not follow a roofline, or which is a vertical system, or which is a system which at least substantially follows the roofline at a specific angle, on the basis of which data and taking account the above-mentioned available, individual profiles (CP; TR; VA; BP), output data are generated by the computer program regarding the profiles (CP; TR;

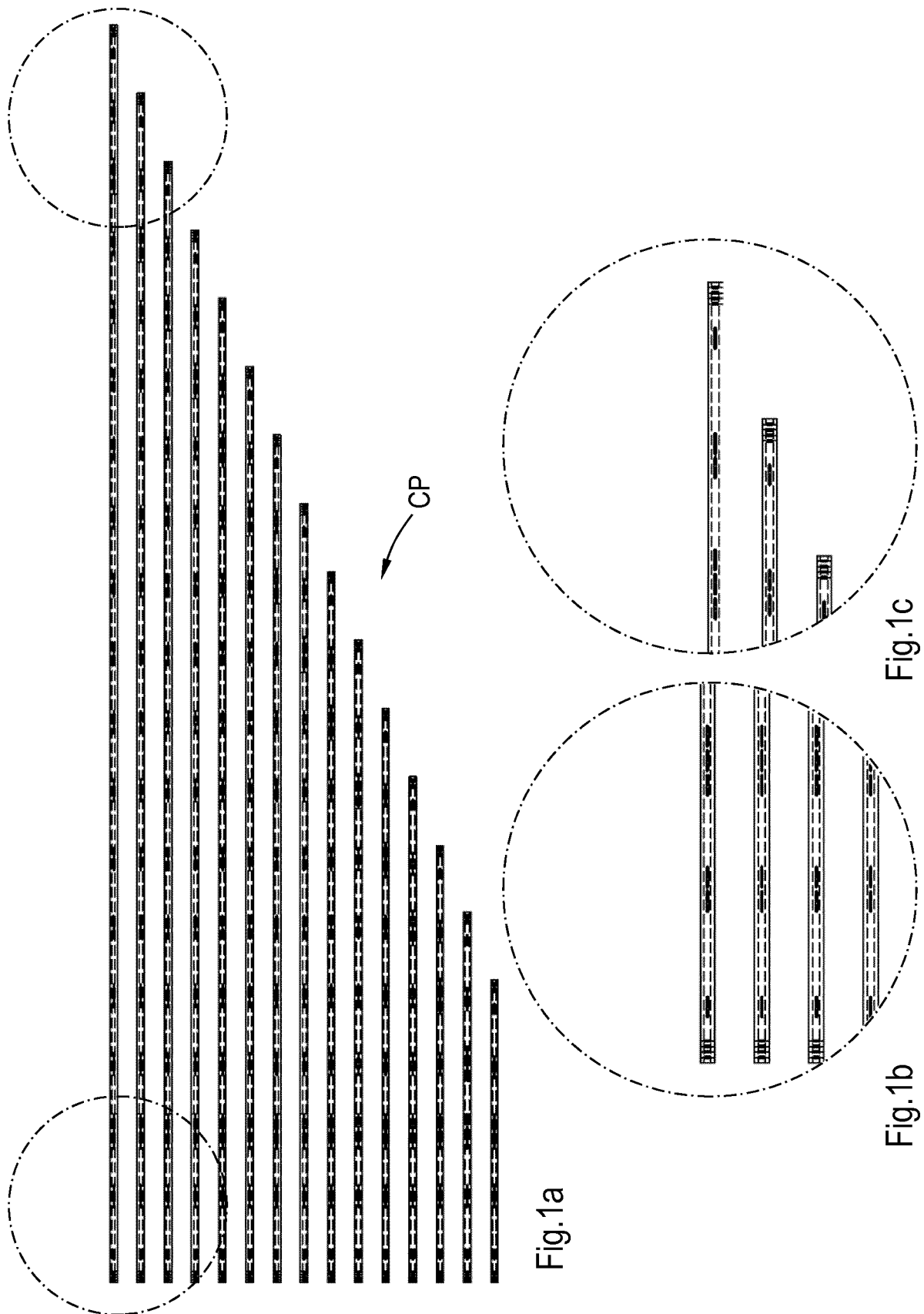
VA; BP) to be actually manufactured, the profile lengths, the position of the fixing holes to be punched and of the bending angles, and an overview of these data is provided.

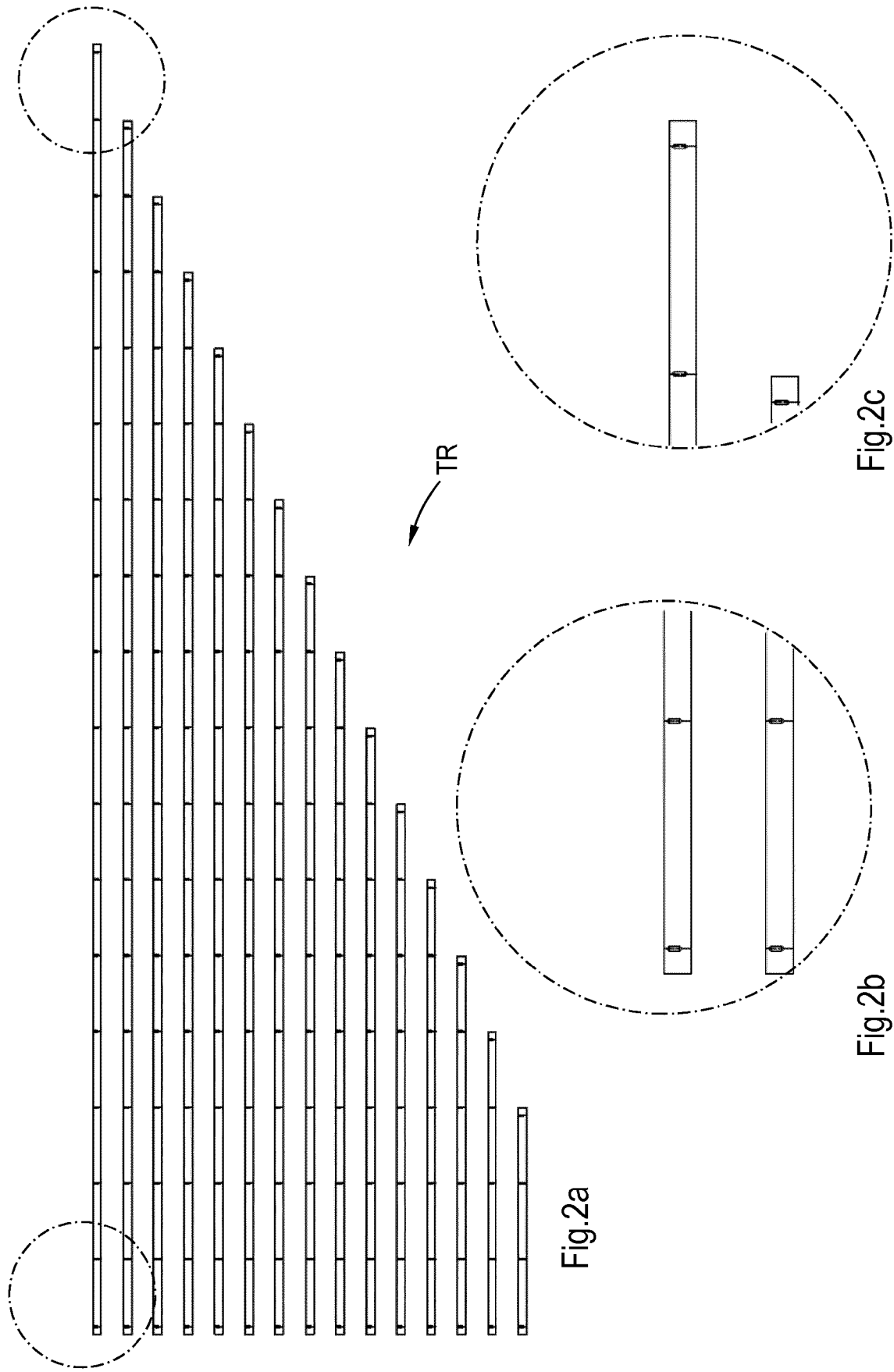
12. The method according to claim 11, wherein on the basis of the input data supplied to the manufacturer, after the manufacture, a package is prepared comprising at least the prefabricated profiles which are important for the ordered rail system.

13. The method according to claim 12, wherein the package is transported to an installer or directly to a customer.

14. A computer program suitable for implementing the method according to any one of claims 1 to 13.

15. A package comprising the combination of manufactured profiles, selected by the computer program according to claim 14, which are necessary to assemble the rail system.





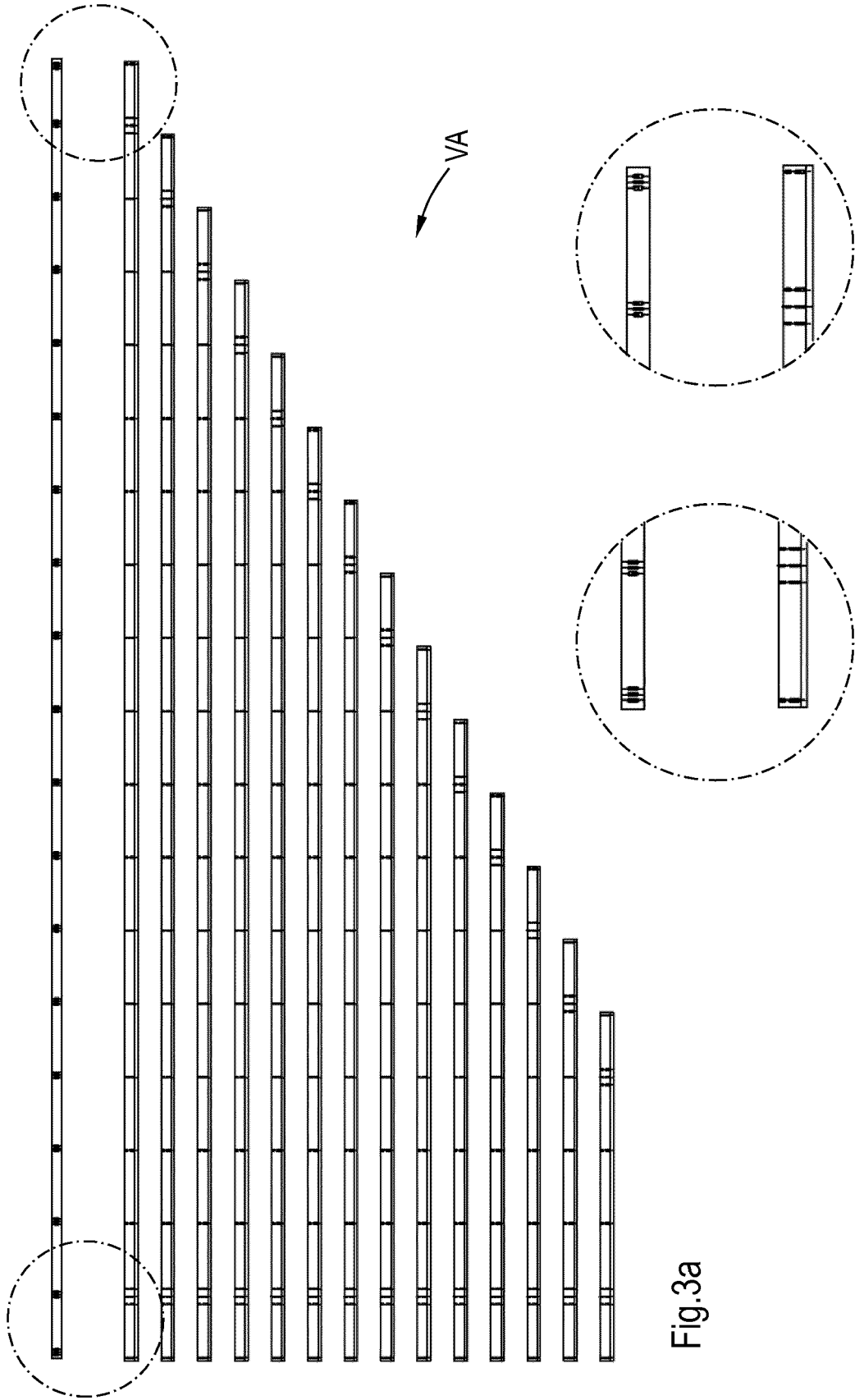


Fig.3a

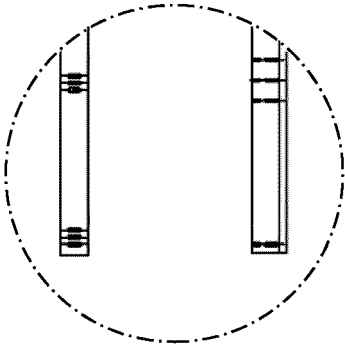


Fig.3b

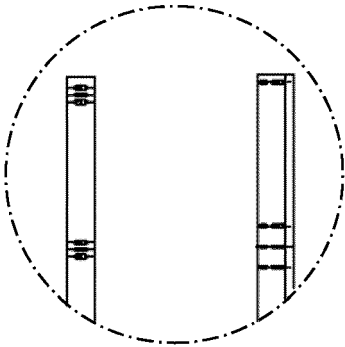
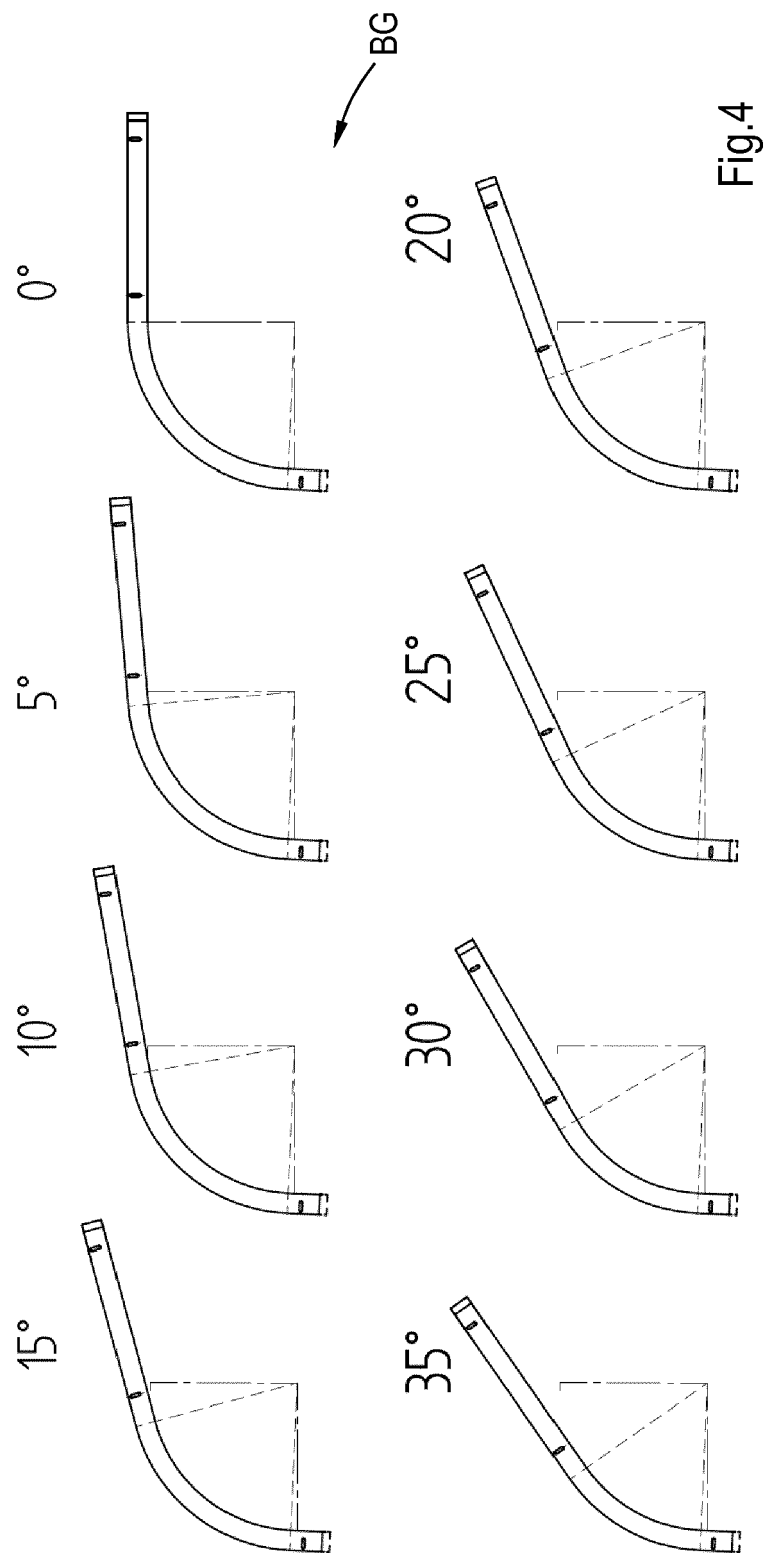
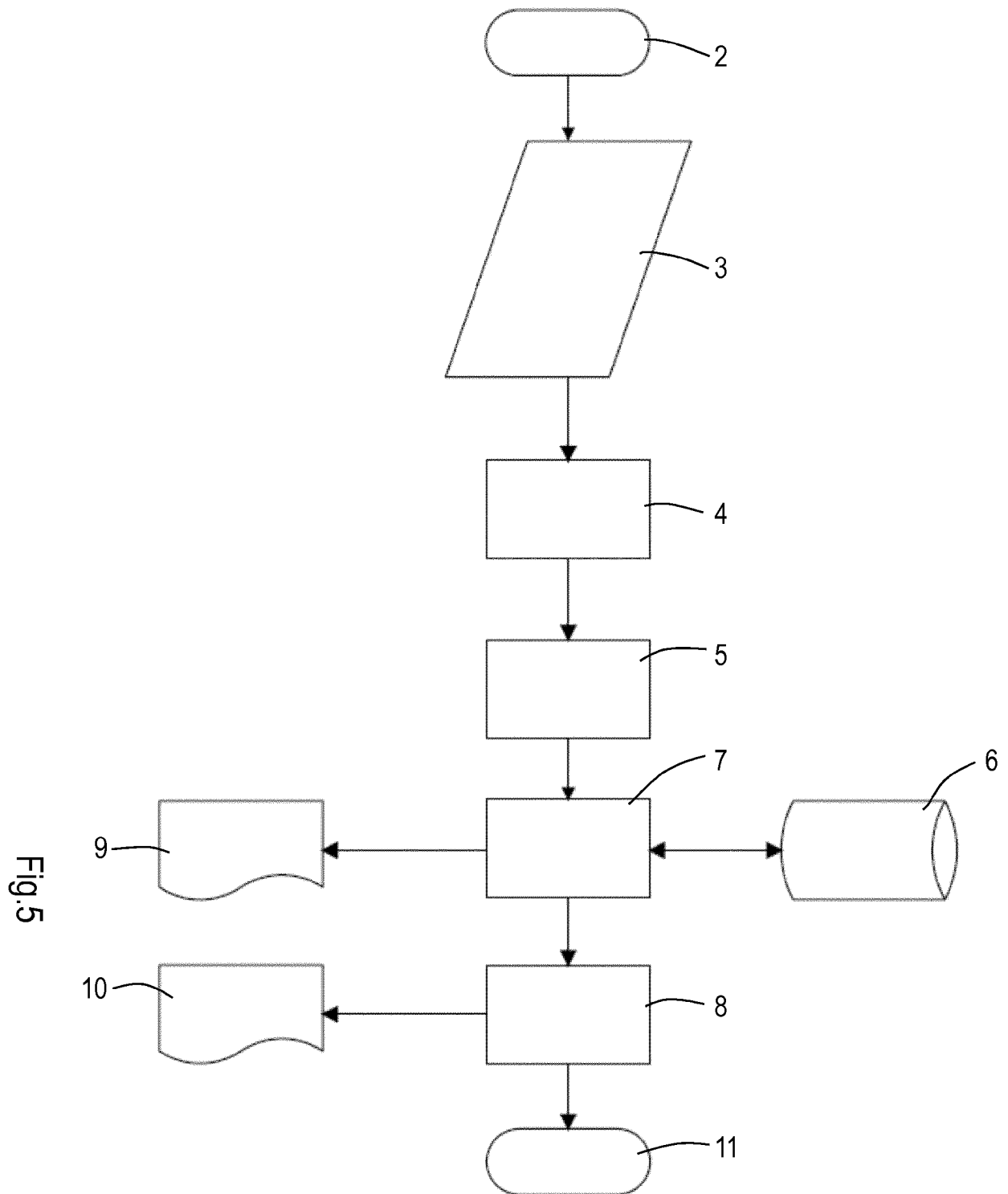


Fig.3c





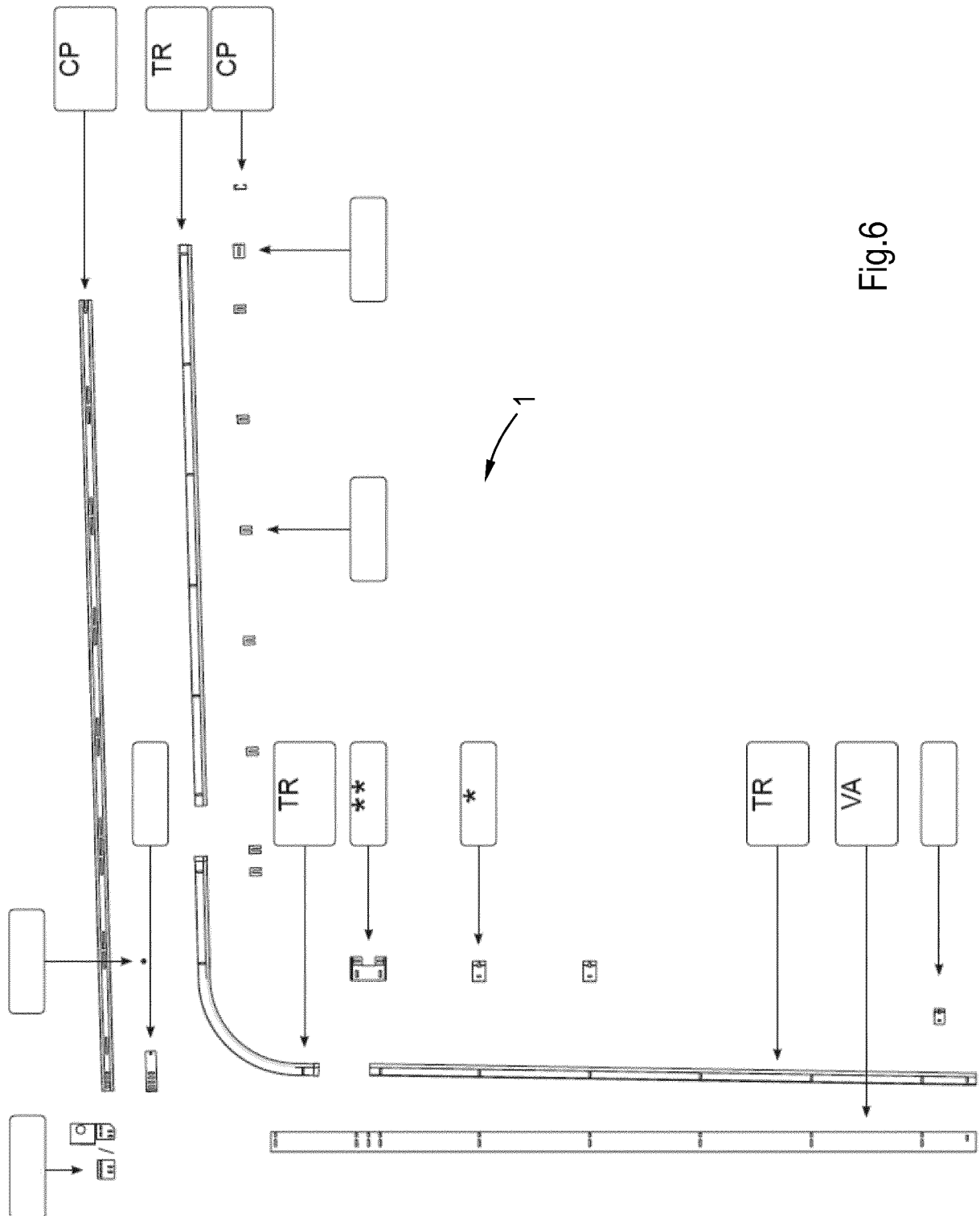


Fig.6

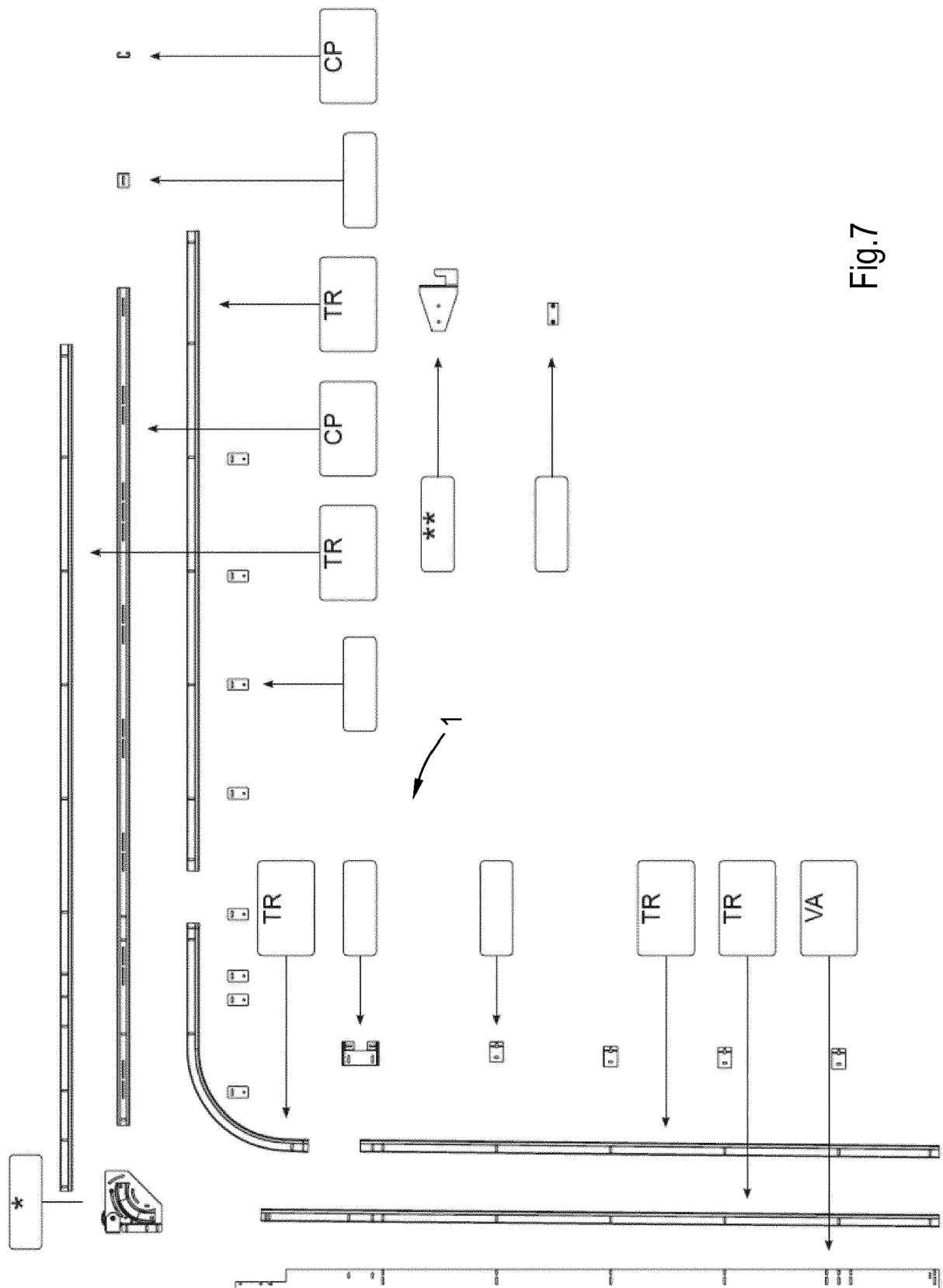


Fig.7

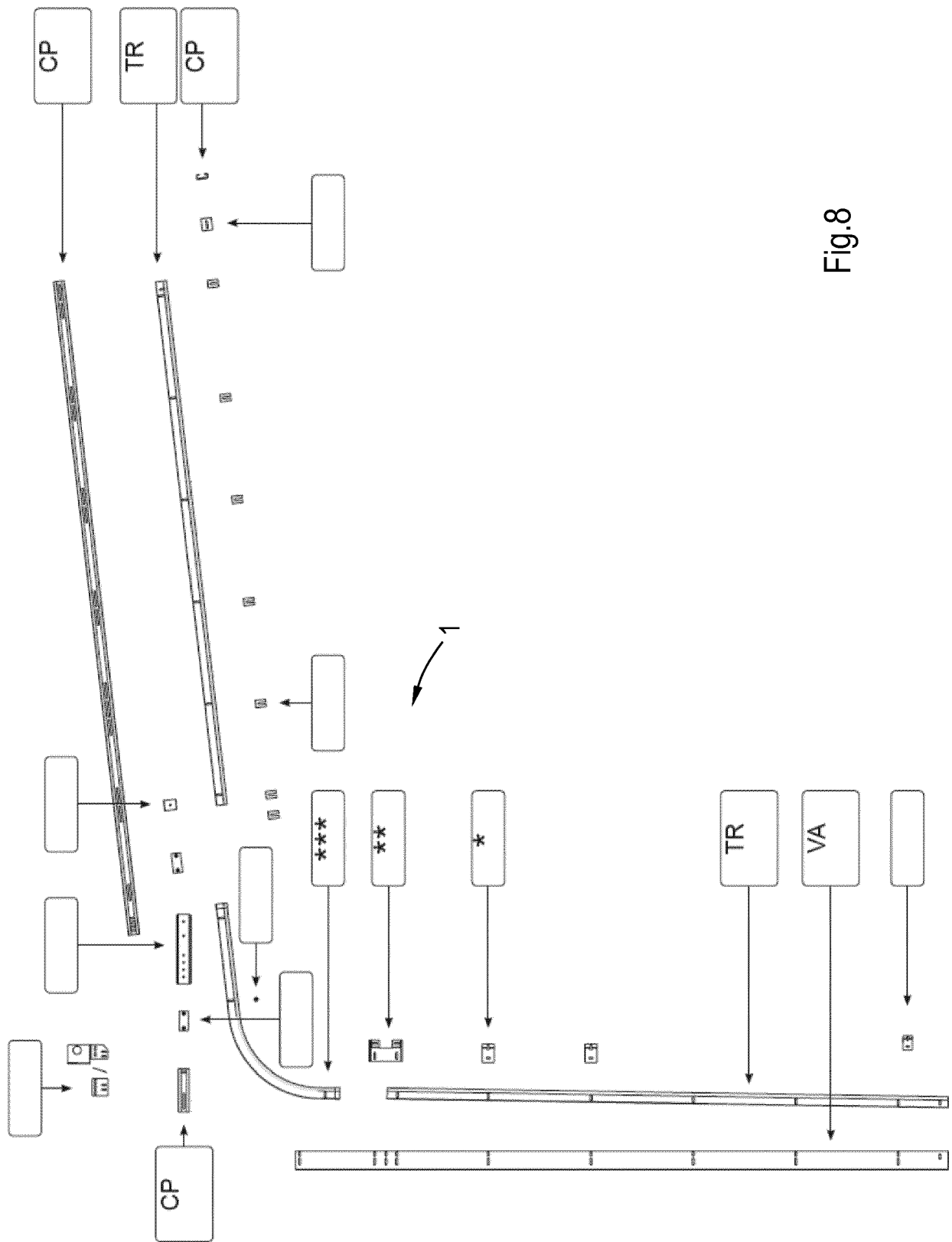


Fig.8



EUROPEAN SEARCH REPORT

Application Number
EP 16 19 3262

5

10

15

20

25

30

35

40

45

50

55

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	US 6 047 761 A (JAEHNEN EDWIN C [US] ET AL) 11 April 2000 (2000-04-11)	1-8,10, 15	INV. E05D15/24 G05B19/00
Y	* column 7, line 58 - column 8, line 51 * * column 10, line 8 - line 21 * * figure 7 *	11-14	ADD. B21D28/00
Y	----- AU 2010 210 027 A1 (TRACKING INNOVATIONS PTY LTD) 24 February 2011 (2011-02-24) * claim 11 *	11-14	
X	----- WO 2007/124576 A1 (CANIMEX INC [CA]; BEAUDOIN FRANCOIS [CA]; PROVENCHER PASCAL [CA]) 8 November 2007 (2007-11-08) * abstract; figures *	15	
Y		12,13	
A	-----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D B21D G05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 February 2017	Examiner Witasse-Moreau, C
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 19 3262

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-02-2017

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6047761 A	11-04-2000	NONE	
AU 2010210027 A1	24-02-2011	NONE	
WO 2007124576 A1	08-11-2007	CA 2642857 A1	08-11-2007
		US 2007283525 A1	13-12-2007
		WO 2007124576 A1	08-11-2007

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82