

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference E0121722-FC	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/IB2019/056064	International filing date (day/month/year) 16.07.2019	Priority date (day/month/year) 25.07.2018	
International Patent Classification (IPC) or national classification and IPC INV. B26D5/00			
Applicant FK Group S.p.A.			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>10</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☐ (sent to the applicant and to the International Bureau) a total of sheets, as follows: ☐ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☒ Box No. VII Certain defects in the international application ☐ Box No. VIII Certain observations on the international application			
Date of submission of the demand 25.05.2020		Date of completion of this report 04.11.2020	
Name and mailing address of the international preliminary examining authority:  European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016		Authorized officer Falconi, Riccardo Telephone No. +31 70 340-8095	



PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(PCT Rule 71.1)

To:

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Date of mailing
(day/month/year)

04.11.2020

Applicant's or agent's file reference
E0121722-FC

IMPORTANT NOTIFICATION

International application No.
PCT/IB2019/056064

International filing date (day/month/year)
16.07.2019

Priority date (day/month/year)
25.07.2018

Applicant
FK Group S.p.A.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining authority:



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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/IB2019/056064

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-14 as originally filed

Claims, Numbers

1-10 as originally filed

Drawings, Sheets

1/6-6/6 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IB2019/056064

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 12.10.2020 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-9</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-9</u>
Industrial applicability (IA)	Yes: Claims	<u>1-9</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 US 2002/002416 A1 (HERMAN JR JAMES S [US]) 3 January 2002
(2002-01-03)
- D2 US 2013/177215 A1 (CAMPBELL ROBERT L [US] ET AL) 11 July 2013
(2013-07-11)
- D3 US 5 172 326 A (CAMPBELL JR ROBERT L [US] ET AL) 15 December
1992 (1992-12-15)

1 Independent claims

Notwithstanding the clarity issues highlighted in Item VIII below, the present application does not meet the criteria of Article 33(3) PCT, because the subject-matter of claim 1, 5 and 10 does not involve an inventive step.

- 1.1 D1 (US2002002416) is still regarded as being the prior art closest to the subject-matter of claim 1, and discloses (the references between parentheses applying to this document) a method of aligning a cutting trajectory of a flat element with respect to a selected graphic pattern on said flat element, comprising the steps of:
 - (i) providing a working file wherein are stored the initial spatial coordinates of the trajectory defining the cutting trajectory with respect to a reference system, and the graphic pattern coordinates defining the position of said selected graphic pattern with respect to the cutting trajectory, and graphic pattern coordinates defining the position of additional graphic patterns (see "*The controller 60 includes a computer 62 [...] the computer 62 includes, or is connected to a storage device for retaining sufficient data to form the marker 140 or the periphery of parts to be cut as well as the programs for preliminary nesting and generation of cutting instructions*" in paragraph [0027] and see also "*The parts 120 to be cut from the patterned sheet material 160 are digitized in the computer memory. If multiple parts 120 are to be cut, the parts may be arranged with respect to each other and an ideal fabric pattern to form a preliminary nesting*" in paragraph [0036]);

(ii) positioning the flat element to be cut on a support table (see "*The cutting table assembly 20 includes a support surface 22 upon which the sheet material 160 is spread*" in paragraph [0025] and see the collection of "*parts 120*" positioned on the "*cutting table assembly 20*" in figure 1);

(iii) projecting onto the flat element, by means of a projector device, the image of a reference figure uniquely associated with the coordinates of the cutting trajectory and/or the coordinates relative to the selected graphic pattern (see "*The projection system 70 is operably connected to the computer 62 and includes a projector 72, preferably a laser projector and optics for projecting the reference image 170 onto [...] sheet material 160 disposed on the support surface*" in paragraph [0032] and figure 1);

(iv) moving the image of the reference figure or the virtual image of the selected graphic pattern until a portion of the said virtual image of the selected graphic pattern coincides with the corresponding real image of the selected graphic pattern taken by the camera (see "*A match point 144 is a specific location on the part 120 to be cut that is selected to align with a given pattern characteristic 152 [...] the match point 144 places a given portion (or point) of a pattern characteristic 152 at a predetermined location on the part 120 [...] a desired alignment between the marker 140 and the sheet material 160 is defined. The alignment includes the correspondence of a particular point in the part 120 to be cut and specific pattern characteristic 152 on the sheet material 160. That is, any match points 144 are identified and the relationship of the match point to a specific pattern characteristic 152 is created [...] The alignment of the match points 144 is accomplished through the identification of a variance between an estimated position 180 of a pattern characteristic and an actual position 190 of a corresponding pattern characteristic [...] the identification and inputting of any variance is accomplished by projecting the reference image 170 corresponding to an estimated position of a pattern characteristic 152 onto the sheet material and directly comparing by operator inspection the estimated position of the pattern characteristic with the actual position 190 of the corresponding pattern characteristic 152 of the sheet 160, upon which the reference image is projected*" in paragraphs [0038, 0041, 0042], in combination with "*The operator input device 80 and transforming program 100, allow a reference image 170, part periphery or segment to be transformed including a translation, rotation, distortion or any combination*" in paragraph [0029], which takes into account an alignment operation performed by the operator);

(v) ~~displaying on the monitor~~ the displacement of the image of the cutting trajectory in the position resulting from the movement of the reference figure with respect the image of the additional graphic patterns (see "*The calculated difference between the ideal fabric pattern and the estimated fabric pattern is used to transform the parts to be cut from the sheet material*" in paragraph [0017] in combination with "*any match points 144 are identified and the relationship of the match point to a specific pattern characteristic 152 is created [...] The alignment of the match points 144 is accomplished through the identification of a variance between an estimated position 180 of a pattern characteristic and an actual position 190 of a corresponding pattern characteristic [...] the identification and inputting of any variance is accomplished by projecting the reference image 170 corresponding to an estimated position of a pattern characteristic 152 onto the sheet material and directly comparing by operator inspection the estimated position of the pattern characteristic with the actual position 190 of the corresponding pattern characteristic 152 of the sheet 160, upon which the reference image is projected*" in paragraphs [0041, 0042], and see also "*the projection of a second reference image 170' wherein the same procedure of projecting, identifying (inspecting), inputting and calculating is conducted*" paragraph [0059]).

1.2 The subject-matter of claim 1 therefore differs from the teaching of D1 in that (emphasis added):

(I) "*framing, by means of a camera, at least a portion of the flat element wherein there is present at least a part of the selected graphic pattern and at least a part of said image of the reference figure*";

(II) "*displaying on a monitor the image framed by the camera and a virtual image of the selected graphic pattern and of the additional graphic patterns defined by the coordinates relative to the respective graphic patterns*";

(III) "*displaying on the monitor [the displacement of the image of the cutting trajectory in the position resulting from the movement of the reference figure with respect the image of the additional graphic patterns]*".

The subject-matter of claim 1 is therefore new.

1.3 The technical effect of features (I) - (III) is present to an operator visual information regarding the alignment to be performed.

- 1.4 The problem to be solved by the present invention may therefore be regarded as how to facilitate the alignment between the reference figure and the graphic pattern projected on the flat element, said alignment being carried out by an operator.
- 1.5 The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

The method disclosed in D1 relies on the visual inspection carried out by the operator in order to determine the *"difference or distance between the location of the projected estimated positions 180 of the pattern characteristic 152 and the corresponding actual position 190 of the pattern characteristic"*, which is then followed by the operator using *"the input device 80 to input into the computer 62, the distance between an estimated position 180 of a pattern characteristic 152 and the actual position 190 of a corresponding pattern characteristic"* (see paragraph [0046]), hence performing manual alignment (see also *"input device 80 and transforming program 100, allow a reference image 170, part periphery or segment to be transformed including a translation, rotation, distortion or any combination"* in paragraph [0029] of D1). As can be seen from figure 1, the input device 80 is remotely located with respect to the controller 60, which *"includes a computer 62 having a standard processor and may include a display 64 for displaying the image on a CRT or LCD"* (paragraph [0027]).

On the other hand, the features (I) - (III) introduce the use of a camera and the display on a monitor of the information needed by an operator in order to perform alignment between the actual and the desired shape to be cut represents an alternative to the actual visual inspection carried out by the machine operator, i.e. it represent a different but equivalent way of gathering information regarding the alignment compensation to be performed.

From these considerations it follows that, when faced with the problem of facilitating the inspection of the alignment compensation process, it would be obvious for the skilled person to add a camera above the sheet so that the images taken would ease the compensation process carried out by the operator (see e.g. document D2, US20130177215, in which a combination of camera and projector is used in order to perform the inspection of a flat element, in the specific case leather or fabric).

- 1.5.1 The same reasoning applies, *mutatis mutandis*, to the subject-matter of the corresponding independent claims 5 and 10 (see respectively the system in figure 1 and see "*transforming program 100*" in paragraph [0022]), which therefore are also considered not inventive.

2 Dependent claims

Dependent claims 2 - 4 and 6 - 9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

- 2.1 The additional features of claim 2 are disclosed in D1 (see "*The projection system 70 is operably connected to the computer 62 and includes a projector 72, preferably a laser projector and optics for projecting the reference image 170 onto the support surface 22, or sheet material 160 disposed on the support surface*" in paragraph [0032], wherein "*The reference image 170 may be [...] a portion of the marker 140, merely a line corresponding to the part(s) to be cut, a line corresponding to a pattern characteristic, or a point*" in paragraph [0029]). Therefore, the technical features of claim 2 cannot contribute to an inventive subject - matter.
- 2.2 The additional features of claim 3 relate to the use of a user interface for selecting and moving either the virtual image of the graphic pattern or the image of the reference figure and then update the coordinates of the reference figure accordingly. The technical features of claim 3, therefore, put in place a compensation method for aligning the reference figure (and the corresponding virtual image of the graphic pattern) with the real image of the graphic pattern. The use of a specific interface for carrying out said method is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to properly position the reference figure on the flat surface to be processed (see e.g. document D3, US5172326, in which a similar interface for properly position desired cut patterns is disclosed). Therefore, the technical features of claim 3 cannot contribute to an inventive subject - matter.
- 2.3 The additional features of claim 4 relate to the final coordinates for the cutting trajectory are saved after being properly modified, which would be obvious to the skilled person in view of the necessity to eventually perform the same update cutting trajectory on other flat elements. Therefore, the technical features of claim 4 cannot contribute to an inventive subject - matter.

- 2.4 The additional features of claim 6 relate to the projector device being equipped with actuated axis for positioning said projector in different places. The use of actuated axis for displacing the projector is merely one of several straight-forward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to apply the same method on a surface larger than the filed-of-projection of the projector. Therefore, the technical features of claim 6 cannot contribute to an inventive subject - matter.
- 2.5 The additional features of claims 7 and 8 are disclosed in D1 (see "*The projection system 70 is operably connected to the computer 62 and includes a projector 72, preferably a laser projector and optics for projecting the reference image 170 onto the support surface 22, or sheet material 160 disposed on the support surface [...] The optics include reflective surfaces such as mirrors and lenses known in the field for directing the laser beam along an optical path to intersect the support surface 22*" in paragraph [0032]) Therefore, the technical features of claims 7 and 8 cannot contribute to an inventive subject - matter.
- 2.6 The additional features of claim 9 relate to the use of a rigid support suitable to receive the flat element and to keep said element in a given position. The use of fastening means to block the flat element in a given position over the support table would be obvious to the skilled person operating a cutting machine in order to ensure that the flat element would not move during the cutting job. Therefore, the technical features of claim 9 cannot contribute to an inventive subject - matter.

3 Industrial applicability

The subject - matter of claims 1 - 9 relates to an apparatus, the corresponding control method and program product implementing said method, for aligning a cutting trajectory with a reference element present on the material to be cut. The industrial applicability is therefore provided.

4 Re Item VII

Certain defects in the international application

- 4.1 In case of further amendments, independent claims 1 and 5 should be drafted in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In the present case, the features known in combination from D1 are listed in paragraph [1.1] above and, as such, belong in the preamble of such claims.

- 4.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the cited documents is not mentioned in the description, nor are these documents identified therein.

- 4.3 The element corresponding to the reference number 2 on the right of figure 3B should be corresponding to the reference number 2'. In fact, said element is referred to as "*cutting trajectory 2'*" in pages 9 and 10 of the description when describing figure 3a and, in order to be consistent, the same reference number 2' should also be applied in figure 3b.