PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Eric Sophir
Foley & Lardner LLP
3000 K Street N.W.
Washington, DC 20007
United States Of America

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)*
Applicant's or agent's file reference P2572-2NWO-128729-0132	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US23/34306	International filing date *(day/month/year)* 02 October 2023 (02.10.2023)
Applicant TESLA, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau preferably through ePCT, or on paper to:
   The International Bureau of WIPO, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland

   For more detailed instructions, see the *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas Telephone No. PCT Helpdesk: 571-272-4300

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Eric Sophir
Foley & Lardner LLP
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Washington, DC 20007
United States Of America

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* FEB 16 2024
Applicant's or agent's file reference P2572-2NWO-128729-0132	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US23/34306	International filing date *(day/month/year)* 02 October 2023 (02.10.2023)
Applicant TESLA, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau preferably through ePCT, or on paper to:
   The International Bureau of WIPO, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland

   For more detailed instructions, see the *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas Telephone No. PCT Helpdesk: 571-272-4300

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference		FOR FURTHER ACTION
P2572-2NWO-128729-0132		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US23/34306	02 October 2023 (02.10.2023)	30 September 2022 (30.09.2022)
Applicant TESLA, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ 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 (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 4C

   ☐ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☒ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US23/34306

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. B25J 15/00; B25J 9/10; B25J 15/02 (2023.01)
ADD.
CPC - INV. B25J 15/0009; B25J 9/1045; B25J 15/0233
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)
See Search History document

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

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	DE 102020207037 B4 (KUKA DEUTSCHLAND GMBH) 13 January 2022; See Figs. 1-7; paragraphs [0017], [0069], [0071], [0072], [0077]; machine translation	1-6, 10-16, 20 — 7-9, 17-19
Y	US 2013/0193704 A1 (GM GLOBAL TECHNOLOGY OPERATIONS, INC. ET AL.) 01 August 2013; See Figs. 3, 12; paragraph [0046]	7-9, 17-19
A	US 2011/0071678 A1 (IHRKE ET AL.) 24 March 2011; See Fig. 4; Abstract	1-20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 December 2023 (18.12.2023)	FEB 16 2024
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas Telephone No. PCT Helpdesk: 571-272-4300

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Eric Sophir
Foley & Lardner LLP
3000 K Street N.W.
Washington, DC 20007
United States Of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)* FEB 16 2024

Applicant's or agent's file reference
P2572-2NWO-128729-0132

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US23/34306	02 October 2023 (02.10.2023)	30 September 2022 (30.09.2022)

International Patent Classification (IPC) or both national classification and IPC
IPC - INV. B25J 15/00; B25J 9/10; B25J 15/02 (2023.01)
ADD.
CPC - INV. B25J 15/0009; B25J 9/1045; B25J 15/0233
ADD.

Applicant TESLA, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ 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 Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and 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

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	18 December 2023 (18.12.2023)	Shane Thomas PCT Help Desk Telephone No. 571-272-4300

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US23/34306

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ 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 (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed.

   b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),

      ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.

4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US23/34306

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	7-9, 17-19	YES
	Claims	1-6, 10-16, 20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6, 10-16 and 20 lack novelty under PCT Article 33(2) as being anticipated by DE 10 2020 207 037 B4 to KUKA Deutschland GmbH, (hereinafter "KUKA").

As per claim 1, as best understood, KUKA discloses a robotic hand system (The gripper body forms a base on which the at least two or more gripper fingers are mounted or attached. The gripper body can form a hand root on which the two or more gripper fingers are movably or rigidly arranged, the gripper body being able to be attached to a tool flange of a robot arm or an analog handling device; Fig. 1; paragraph [0017], machine translation) comprising: a palm region (3; the gripper 1 has precisely two gripper fingers 2.1, 2.2 that are adjustably mounted on the gripper base body 3. The two gripper fingers 2.1, 2.2 are each mounted pivotably on the gripper body 3; Fig. 1; paragraph [0069], machine translation); and one or more fingers (2.1, 2.2, 4-6; Figs. 1, 2), each finger comprising: an actuator device (4, 5; A drive motor 4 is arranged on the gripper body 3 . In the case of the present exemplary embodiment, the drive motor 4 is designed to move both one gripper finger 2.1 and the other gripper finger 2.2. For this purpose, the drive motor 4 has a winch 5 on its motor shaft, on which two ropes 6 can be wound up and unwound, one rope 6 each being connected to one of the two gripper fingers 2.1, 2.2 in order to pull them through depending on the drive to swing, bend and tension the drive motor 4; Fig. 1; paragraph [0069], machine translation); a respective proximal member (9; Fig. 2) having a first end (7.1, 7a; Fig. 2) mechanically coupled to the palm region (For each gripper finger 2.1, 2.2, the gripper base body 3 in conjunction with at least the respective finger root phalange 7a forms a first group of articulated proximal limbs (gripper base body 3 and finger root phalange 7a), which has a first joint stiffness G1; Fig. 2; paragraph [0072], machine translation) and configured to rotate around a respective first pivot (S; Provided on the respective gripper fingers 2.1, 2.2 is a longitudinally extending traction means 8.1, 8.2 along the kinematic chain of the respective finger links 7, which is connected to the respective fingertip link 7.7, 7c and which is designed for pivoting (4 to 5 and 8th to 9) of the gripper finger 2.1, 2.2 about a pivot axis S assigned to the finger root segment 7.1, 7a by pulling on the traction means 8.1, 8.2 and for bending (5 to 6 and 9 to 10) of the kinematic chain of the finger links 7 also by the same pulling on the traction means 8.1, 8.2; Figs. 2-7; paragraph [0071], machine translation) relative to the palm region; a respective distal member (7.2-7.7, 7b, 7c; Fig. 2) having a first end (7.2, 7b; Fig. 2) mechanically coupled to a second end of the proximal member (top 9; Fig. 2) and configured to rotate around a respective second pivot (center F2/G2; the first joint stiffness G1 of the first group of articulated links is set by a single first spring element F1 associated with the joints of the connected links of the first group. The second joint rigidity G2 of the second group of articulated links is set by several individual second spring elements F2, which are assigned to the joints of the connected links of the second group. The third joint stiffness G3 of the third group of articulated links is adjusted by a single third spring element F3, which is assigned to the joints of the connected links of the third group; Figs. 2-7; paragraph [0077], machine translation) relative to the proximal member; and a respective cable (6; For this purpose, the drive motor 4 has a winch 5 on its motor shaft, on which two ropes 6 can be wound up and unwound, one rope 6 each being connected to one of the two gripper fingers 2.1, 2.2 in order to pull them through depending on the drive to swing, bend and tension the drive motor 4; Fig. 1; paragraph [0069], machine translation; 8.1, 8.2; Provided on the respective gripper fingers 2.1, 2.2 is a longitudinally extending traction means 8.1, 8.2 along the kinematic chain of the respective finger links 7, which is connected to the respective fingertip link 7.7, 7c and which is designed for pivoting (4 to 5 and 8th to 9) of the gripper finger 2.1, 2.2 about a pivot axis S assigned to the finger root segment 7.1, 7a by pulling on the traction means 8.1, 8.2 and for bending (5 to 6 and 9 to 10) of the kinematic chain of the finger links 7 also by the same pulling on the traction means 8.1, 8.2; Figs. 2-7; paragraph [0071], machine translation) having a first portion (bottom 6; Fig. 1; 8.1/8.2 below 9; Fig. 2) coupled to the actuator and a second portion (top 6; Fig. 1; 8.1/8.2 in contact with 9 and above 9; Fig. 2) extending along the proximal member and the distal member (Figs. 1-7; paragraphs [0069], [0071], machine translation), the second portion separated away from the first pivot and the second pivot (Fig. 2) and having an end (tip of top 8.1/8.2; Fig. 2) with a higher dimension than a diameter of the cable (Fig. 2), the end with higher dimension structured to engage the distal member (7.7, 7c; Fig. 2) when the cable is pulled by the actuator (Figs. 2-7; paragraph [0071], machine translation).

As per claim 2, KUKA discloses the robotic hand system of claim 1, wherein the end with higher dimension is floating within a region of the distal member (top/tip of 8.1/8.2 floats, via spring F3/G3, in a space defined above 7.6/7b and the left wall of 2.1/right wall of 2.2; The third joint stiffness G3 of the third group of articulated links is adjusted by a single third spring element F3, which is assigned to the joints of the connected links of the third group; The individual third spring element F3 is designed as a thrust spring; Figs. 2, 3, 6, 7; paragraphs [0077], [0078], machine translation).

As per claim 3, KUKA discloses the robotic hand system of claim 1, wherein the end with higher dimension includes at least one of: a potted end (tip of top 8.1/8.2; Fig. 2); or an end with a potted insert.

-***-Continued in Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US23/34306

Box No. VII Certain defects in the international application

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

Claims 1, 10, 11, 15, 16 and 20 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof:

With regards to Claim 1, Claim 1 refers to "coupled to the palm region robot" (lines 5, 6) which is improper. For the purposes of the written opinion, "coupled to the palm region robot" of Claim 1 is best understood as "coupled to the palm region".

With regards to Claim 10, Claim 10 refers to "the robotic hand system of claim 1, a distance" (line 1) which is improper. For the purposes of the written opinion, "the robotic hand system of claim 1, a distance" of Claim 10 is best understood as "the robotic hand system of claim 1, wherein a distance".

With regards to Claim 11, Claim 11 refers to "coupled to base member" (line 3) which is improper. For the purposes of the written opinion, "coupled to base member" of Claim 11 is best understood as "coupled to a base member".

With regards to Claim 15, Claim 15 refers to "the respective cable is pulled by the respective actuator" (line 3) which is improper. For the purposes of the written opinion, "the respective cable is pulled by the respective actuator" of Claim 15 is best understood as "the cable is pulled by the actuator".

With regards to Claim 16, Claim 16 refers to "the finger device of claim q1" (line 1) which is improper. For the purposes of the written opinion, "the finger device of claim q1" of Claim 16 is best understood as "the finger device of claim 11".

With regards to Claim 20, Claim 20 refers to "a distance between the cable and the first pivot" (line 1) which is improper. For the purposes of the written opinion, "a distance between the cable and the first pivot" of Claim 20 is best understood as "wherein a distance between the cable and the first pivot".

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US23/34306

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 20 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because Claim 20 is indefinite for the following reason(s):

With regards to Claim 20, Claim 20 depends on Claim 1 which is improper. "the finger device of claim 1" (line 1) lacks an antecedent basis because a finger device is not referred to prior in Claim 20, nor in Claim 1 in which Claim 20 depends from. For the purposes of the written opinion, Claim 20 is best understood as dependent on Claim 11.

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
-***-Continued From Box V. 2: Citations and Explanations-***-

As per claim 4, KUKA discloses the robotic hand system of claim 1, wherein each finger comprises a respective channel structure (inner 9/inner 7.2-7.7 holding 8.1/8.2; Fig. 2) extending at least partially along the respective proximal member and the respective distal member, the respective channel structuro hosting at least partially the second portion of the respective cable (Fig. 2).

As per claim 5, KUKA discloses the robotic hand system of claim 4, wherein the end with higher dimension of the second portion of the respective cable is structured to engage a ledge structure (top 7.7; Fig. 2) of the respective channel structure when the respective cable is pulled by the respective actuator (Figs. 2-7).

As per claim 6, KUKA discloses the robotic hand system of claim 1, wherein each finger comprises: a respective first torsion spring (F1, G1; In the case of the first embodiment of the 2 the individual first spring element F1 is each designed as a torsion spring. The plurality of second spring elements F2 are each also designed as a torsion spring; Fig. 2; paragraph [0078], machine translation) placed around the respective first pivot; and a respective second torsion spring (F2, G2; Fig. 2) placed around the respective second pivot (Fig. 2; paragraph [0078], machine translation).

As per claim 10, as best understood, KUKA discloses the robotic hand system of claim 1, wherein a distance between the respective cable and the respective first pivot varies and/or a distance between the respective cable and the respective second pivot varies (the distance between top 8.1/8.2 located in 7.7/7c and the pivot joint top F2/G2 decreases as actuator 4/5 pulls the cables downwards compressing spring F3, G3; Figs. 1, 2, 6, 7; paragraph [0069], machine translation).

As per claim 11, as best understood, KUKA discloses a finger device (The gripper body forms a base on which the at least two or more gripper fingers are mounted or attached. The gripper body can form a hand root on which the two or more gripper fingers are movably or rigidly arranged, the gripper body being able to be attached to a tool flange of a robot arm or an analog handling device; Fig. 1; paragraph [0017], machine translation), comprising: an actuator device (4, 5; A drive motor 4 is arranged on the gripper body 3 . In the case of the present exemplary embodiment, the drive motor 4 is designed to move both one gripper finger 2.1 and the other gripper finger 2.2. For this purpose, the drive motor 4 has a winch 5 on its motor shaft, on which two ropes 6 can be wound up and unwound, one rope 6 each being connected to one of the two gripper fingers 2.1, 2.2 in order to pull them through depending on the drive to swing, bend and tension the drive motor 4; Fig. 1; paragraph [0069], machine translation); a proximal member (9; Fig. 2) having a first end (7.1, 7a; Fig. 2) mechanically coupled to a base member (3; the gripper 1 has precisely two gripper fingers 2.1, 2.2 that are adjustably mounted on the gripper base body 3. The two gripper fingers 2.1, 2.2 are each mounted pivotably on the gripper body 3; Fig. 1; paragraph [0069], machine translation) and configured to rotate around a first pivot (S; Provided on the respective gripper fingers 2.1, 2.2 is a longitudinally extending traction means 8.1, 8.2 along the kinematic chain of the respective finger links 7, which is connected to the respective fingertip link 7.7, 7c and which is designed for pivoting (4 to 5 and 8th to 9) of the gripper finger 2.1, 2.2 about a pivot axis S assigned to the finger root segment 7.1, 7a by pulling on the traction means 8.1, 8.2 and for bending (5 to 6 and 9 to 10) of the kinematic chain of the finger links 7 also by the same pulling on the traction means 8.1, 8.2; Figs. 2-7; paragraph [0071], machine translation) relative to the base member; a distal member (7.2-7.7, 7b, 7c; Fig. 2) having a first end (7.2, 7b; Fig. 2) mechanically coupled to a second end of the proximal member (top 9; Fig. 2) and configured to rotate around a second pivot (center F2/G2; the first joint stiffness G1 of the first group of articulated links is set by a single first spring element F1 associated with the joints of the connected links of the first group. The second joint rigidity G2 of the second group of articulated links is set by several individual second spring elements F2, which are assigned to the joints of the connected links of the second group. The third joint stiffness G3 of the third group of articulated links is adjusted by a single third spring element F3, which is assigned to the joints of the connected links of the third group; Figs. 2-7; paragraph [0077], machine translation) relative to the proximal member; and a cable (6; For this purpose, the drive motor 4 has a winch 5 on its motor shaft, on which two ropes 6 can be wound up and unwound, one rope 6 each being connected to one of the two gripper fingers 2.1, 2.2 in order to pull them through depending on the drive to swing, bend and tension the drive motor 4; Fig. 1; paragraph [0069], machine translation; 8.1, 8.2; Provided on the respective gripper fingers 2.1, 2.2 is a longitudinally extending traction means 8.1, 8.2 along the kinematic chain of the respective finger links 7, which is connected to the respective fingertip link 7.7, 7c and which is designed for pivoting (4 to 5 and 8th to 9) of the gripper finger 2.1, 2.2 about a pivot axis S assigned to the finger root segment 7.1, 7a by pulling on the traction means 8.1, 8.2 and for bending (5 to 6 and 9 to 10) of the kinematic chain of the finger links 7 also by the same pulling on the traction means 8.1, 8.2; Figs. 2-7; paragraph [0071], machine translation) having a first portion (bottom 6; Fig. 1; 8.1/8.2 below 9; Fig. 2) coupled to the actuator and a second portion (top 6; Fig. 1; 8.1/8.2 in contact with 9 and above 9; Fig. 2) extending along the proximal member and the distal member, the second portion separated away from the first pivot and the second pivot (Fig. 2) and having an end (tip of top 8.1/8.2; Fig. 2) with a higher dimension than a diameter of the cable (Fig. 2), the end with higher dimension structured to engage the distal member (7.7, 7c; Fig. 2) when the cable is pulled by the actuator (Figs. 2-7; paragraph [0071], machine translation).

As per claim 12, KUKA discloses the finger device of claim 11, wherein the end with higher dimension is floating within a region of the distal member (top/tip of 8.1/8.2 floats, via spring F3/G3, in a space defined above 7.6/7b and the left wall of 2.1/right wall of 2.2; The third joint stiffness G3 of the third group of articulated links is adjusted by a single third spring element F3, which is assigned to the joints of the connected links of the third group; The individual third spring element F3 is designed as a thrust spring; Figs. 2, 3, 6, 7; paragraphs [0077], [0078], machine translation).

As per claim 13, KUKA discloses the finger device of claim 11, wherein the end with higher dimension includes at least one of: a potted end (tip of top 8.1/8.2; Fig. 2); or an end with a potted insert.

As per claim 14, KUKA discloses the finger device of claim 11, further comprises a channel structure (inner 9/inner 7.2-7.7 holding 8.1/8.2; Fig. 2) extending at least partially along the proximal member and the distal member, the channel structure hosting at least partially the second portion of the cable (Fig. 2).

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As per claim 15, as best understood, KUKA discloses the finger device system of claim 14, wherein the end with higher dimension of the second portion of the cable is structured to engage a ledge structure (top 7.7; Fig. 2) of the channel structure when the cable is pulled by the actuator (Figs. 2-7).

As per claim 16, as best understood, KUKA discloses the finger device of claim 11, further comprises: a first torsion spring (F1, G1; In the case of the first embodiment of the 2 the individual first spring element F1 is each designed as a torsion spring. The plurality of second spring elements F2 are each also designed as a torsion spring; Fig. 2; paragraph [0078], machine translation) placed around the first pivot; and a second torsion spring (F2, G2; Fig. 2) placed around the second pivot (Fig. 2; paragraph [0078], machine translation).

As per claim 20, as best understood, KUKA discloses the finger device of claim 11, wherein a distance between the cable and the first pivot varies and/or a distance between the cable and the second pivot varies (the distance between top 8.1/8.2 located in 7.7/7c and the pivot joint top F2/G2 decreases as actuator 4/5 pulls the cables downwards compressing spring F3, G3; Figs. 1, 2, 6, 7; paragraph [0069], machine translation).

Claims 7-9 and 17-19 lack an inventive step under PCT Article 33(3) as being obvious over KUKA in view of US 2013/0193704 A1 to GM GLOBAL TECHNOLOGY OPERATIONS, INC. et al., (hereinafter "GM").

As per claim 7, KUKA discloses the robotic hand system of claim 1. KUKA further discloses each finger comprises: a respective magnet coupled to the respective first pivot (the restraining means can also bring about a continuously variable joint stiffness at the joint assigned to it. This can be done, for example, by means of electrically controllable magnets and/or by means of magnetic fluids or rheological liquids. In this respect, the continuously variable restraint means can be designed in general so that the momentary joint stiffness of the joints assigned to them can be varied in a controlled manner, i.e. the joint stiffness can be adjusted, for example, in an electrically controlled manner; paragraph [0054], machine translation). KUKA fails to disclose the robotic hand system, wherein each finger comprises: a respective hall effect sensor placed proximate to the respective magnet. GM discloses a robotic hand system (A robotic hand includes a finger with first, second, and third phalanges; Fig. 3; Abstract), wherein each finger (19A-19D; Fig. 3) comprises: a respective hall effect sensor (62A-62C; Fig. 12) placed proximate to a respective magnet (58A-58C; The finger 19A also includes a plurality of joint position sensor assemblies 56A-56C, each of which is configured to measure the absolute angular position of a respective one of the joints 42A-42C and the relative angular position of a phalange relative to a connecting phalange. Each of the joint position sensor assemblies 56A-56C includes a respective magnet 58A-58C and a respective Hall effect sensor 62A-62C; Fig. 12; paragraph [0046]). It would have been obvious to one of ordinary skill in the art before the relevant date to modify KUKA to provide the robotic hand system, wherein each finger comprises: a respective hall effect sensor placed proximate to the respective magnet, as taught by GM, in order to increase the control of the angular positions of each member of the finger.

As per claim 8, KUKA in view of GM discloses the robotic hand system of claim 7. KUKA fails to disclose the respective magnet includes a ring magnet placed around the respective first pivot. GM discloses the respective magnet includes a ring magnet (58A; Fig. 12) placed around a respective first pivot (42A; The finger 19A also includes a plurality of joint position sensor assemblies 56A-56C, each of which is configured to measure the absolute angular position of a respective one of the joints 42A-42C and the relative angular position of a phalange relative to a connecting phalange. Each of the joint position sensor assemblies 56A-56C includes a respective magnet 58A-58C and a respective Hall effect sensor 62A-62C; Fig. 12; paragraph [0046]). It would have been obvious to one of ordinary skill in the art before the relevant date to modify KUKA to provide the respective magnet includes a ring magnet placed around the respective first pivot, as taught by GM, in order to increase the control of the angular positions of each member of the finger.

As per claim 9, KUKA discloses the robotic hand system of claim 1. KUKA further discloses each finger comprises: a respective magnet coupled to the respective second pivot (the restraining means can also bring about a continuously variable joint stiffness at the joint assigned to it. This can be done, for example, by means of electrically controllable magnets and/or by means of magnetic fluids or rheological liquids. In this respect, the continuously variable restraint means can be designed in general so that the momentary joint stiffness of the joints assigned to them can be varied in a controlled manner, i.e. the joint stiffness can be adjusted, for example, in an electrically controlled manner; paragraph [0054], machine translation). KUKA fails to disclose the robotic hand system, wherein each finger comprises: a respective hall effect sensor placed proximate to the respective magnet. GM discloses a robotic hand system (A robotic hand includes a finger with first, second, and third phalanges; Fig. 3; Abstract), wherein each finger (19A-19D; Fig. 3) comprises: a respective hall effect sensor (62A-62C; Fig. 12) placed proximate to a respective magnet (58A-58C; The finger 19A also includes a plurality of joint position sensor assemblies 56A-56C, each of which is configured to measure the absolute angular position of a respective one of the joints 42A-42C and the relative angular position of a phalange relative to a connecting phalange. Each of the joint position sensor assemblies 56A-56C includes a respective magnet 58A-58C and a respective Hall effect sensor 62A-62C; Fig. 12; paragraph [0046]). It would have been obvious to one of ordinary skill in the art before the relevant date to modify KUKA to provide the robotic hand system, wherein each finger comprises: a respective hall effect sensor placed proximate to the respective magnet, as taught by GM, in order to increase the control of the angular positions of each member of the finger.

As per claim 17, KUKA discloses the finger device of claim 11. KUKA further discloses a magnet coupled to the first pivot (the restraining means can also bring about a continuously variable joint stiffness at the joint assigned to it. This can be done, for example, by means of electrically controllable magnets and/or by means of magnetic fluids or rheological liquids. In this respect, the continuously variable restraint means can be designed in general so that the momentary joint stiffness of the joints assigned to them can be varied in a controlled manner, i.e. the joint stiffness can be adjusted, for example, in an electrically controlled manner; paragraph [0054], machine translation). KUKA fails to disclose the finger device, further comprises: a hall effect sensor placed proximate to the magnet. GM discloses a finger device (A robotic hand includes a finger with first, second, and third phalanges; Fig. 3; Abstract), further comprises: a hall effect sensor (62A-62C; Fig. 12) placed proximate to a magnet (58A-58C; The finger 19A also includes a plurality of joint position sensor assemblies 56A-56C, each of which is configured to measure the absolute angular position of a respective one of the joints 42A-42C and the relative angular position

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of a phalange relative to a connecting phalange. Each of the joint position sensor assemblies 56A-56C includes a respective magnet 58A-58C and a respective Hall effect sensor 62A-62C; Fig. 12; paragraph [0046]). It would have been obvious to one of ordinary skill in the art before the relevant date to modify KUKA to provide the finger device, further comprises: a hall effect sensor placed proximate to the magnet, as taught by GM, in order to increase the control of the angular positions of each member of the finger.

As per claim 18, KUKA in view of GM discloses the finger device of claim 17. KUKA fails to disclose the magnet includes a ring magnet placed around the first pivot. GM discloses the magnet includes a ring magnet (58A; Fig. 12) placed around a first pivot (42A; The finger 19A also includes a plurality of joint position sensor assemblies 56A-56C, each of which is configured to measure the absolute angular position of a respective one of the joints 42A-42C and the relative angular position of a phalange relative to a connecting phalange. Each of the joint position sensor assemblies 56A-56C includes a respective magnet 58A-58C and a respective Hall effect sensor 62A-62C; Fig. 12; paragraph [0046]). It would have been obvious to one of ordinary skill in the art before the relevant date to modify KUKA to provide the magnet includes a ring magnet placed around the first pivot, as taught by GM, in order to increase the control of the angular positions of each member of the finger.

As per claim 19, KUKA discloses the finger device of claim 11. KUKA further discloses a magnet coupled to the second pivot (the restraining means can also bring about a continuously variable joint stiffness at the joint assigned to it. This can be done, for example, by means of electrically controllable magnets and/or by means of magnetic fluids or rheological liquids. In this respect, the continuously variable restraint means can be designed in general so that the momentary joint stiffness of the joints assigned to them can be varied in a controlled manner, i.e. the joint stiffness can be adjusted, for example, in an electrically controlled manner; paragraph [0054], machine translation). KUKA fails to disclose the finger device system, further comprises: a hall effect sensor placed proximate to the magnet. GM discloses a finger device (A robotic hand includes a finger with first, second, and third phalanges; Fig. 3; Abstract), further comprises: a hall effect sensor (62A-62C; Fig. 12) placed proximate to a magnet (58A-58C; The finger 19A also includes a plurality of joint position sensor assemblies 56A-56C, each of which is configured to measure the absolute angular position of a respective one of the joints 42A-42C and the relative angular position of a phalange relative to a connecting phalange. Each of the joint position sensor assemblies 56A-56C includes a respective magnet 58A-58C and a respective Hall effect sensor 62A-62C; Fig. 12; paragraph [0046]). It would have been obvious to one of ordinary skill in the art before the relevant date to modify KUKA to provide the finger device system, further comprises: a hall effect sensor placed proximate to the magnet, as taught by GM, in order to increase the control of the angular positions of each member of the finger.

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.