

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)**

To:

see form PCT/ISA/220

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2017/064845

International filing date (day/month/year)  
06.12.2017

Priority date (day/month/year)  
07.12.2016

International Patent Classification (IPC) or both national classification and IPC  
INV. G01N3/14 G01N3/34

Applicant  
MTS SYSTEMS CORPORATION

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 43bis.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 usually 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 66.1bis(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:



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


Date of completion of this opinion

see form  
PCT/ISA/210

Authorized Officer

Mensink, Rob

Telephone No. +31 70 340-0



---

**Box No. I Basis of the 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 43bis.1(a))
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:
    - in the form of an Annex C/ST.25 text file.
    - on paper or in the form of an image file.
  - b.  furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
  - c.  furnished subsequent to the international filing date for the purposes of international search only:
    - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
    - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4.  In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

---

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

---

1. Statement

Novelty (N)	Yes: Claims	<u>1-19</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-19</u>
Industrial applicability (IA)	Yes: Claims	<u>1-19</u>
	No: Claims	

2. Citations and explanations

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

**Box V**

5.1 - The present application does not meet the requirements of Art. 33(1) PCT, because the subject-matter of device **claim 1** does not involve an inventive step in the sense of Art. 33(3) PCT for the following reasons:

Publication JP 2000 097829 A discloses (reference signs in brackets refer to this publication) an impact sensor body (see e.g. paragraph [0008], *The hammer 8 has the impact blade 10 and semiconductor strain gauge (not shown)*) comprising a body of material having a striking edge (see e.g. fig. 1, reference sign 10, *impact blade*) with surfaces extending rearwardly from the striking edge defining upper and lower surfaces and side surfaces extending between the upper and lower surfaces (see e.g. Fig. 3, reference sign 10).

The subject-matter of claim 1 differs from publication JP 2000 097829 A in that it additionally discloses

- i. a primary aperture which extends through the body of material between the upper and lower surfaces, or between the side surfaces;
- ii. the primary aperture being located on a centerline between the side surfaces and transverse to the striking edge;
- iii. wherein a secondary aperture extends through the body of the material between the upper and lower surface, or between the side surfaces;
- iv. the secondary aperture being on the centerline and spaced apart from the primary aperture to form a flexure member.

The objective technical problem to be solved by the present application is how to modify the impact sensor body of publication JP 2000 097829 A in order to provide portions of the sensor body that are in tension and compression with the added benefit that the sensing elements are protected during testing (see e.g. paragraph [0017] of the description presently on file).

The solution proposed in the subject-matter of claim 1 of the present application cannot be considered as involving an inventive step in the sense of Art. 33(3) PCT for the following reasons:

Publication JP 2000 097829 A discloses a strain gauge (see e.g. paragraph [0009]) in order to detect the impact on the sensor body, without providing details of the strain gauge. The skilled person would look for a strain gauge which provides portions of the sensor body that are in tension and compression with the added benefit that the sensing elements are protected during testing, which is disclosed in publication US 2005/0241408 A1.

Publication US 2005/0241408 A1 discloses (reference signs in brackets refer to this publication) an impact sensor body (see e.g. Fig. 2, reference sign 11) comprising a body of material ~~having a striking edge~~ with surfaces extending rearwardly from the striking edge defining upper and lower surfaces (See Fig. 2, surface near reference sign 10 and near lowest reference sign 11, respectively) and side surfaces extending between the upper and lower surfaces (see e.g. Fig. 2, reference sign 5), wherein a primary aperture extends through the body of material ~~between the upper and lower surfaces, or between the side surfaces~~ (see e.g. Fig. 2, aperture close to reference sign 10), the primary aperture being located on a centerline between the side surfaces and transverse to the striking edge (see e.g. Fig. 2, aperture close to reference sign 10), wherein a secondary aperture extends through the body of the material ~~between the upper and lower surface, or between the side surfaces~~ (see e.g. Fig. 2, reference sign 3), ~~the secondary aperture being on the centerline~~ and spaced apart from the primary aperture to form a flexure member.

In other words, the skilled person would select the strain gauge of publication US 2005/0241408 A1 as the strain gauge to be used in the embodiment of publication JP 2000 097829 A in order to be provided with portions of the sensor body that are in tension and compression with the added benefit that the sensing elements are protected during testing.

Locating the second aperture on the centerline 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 form a flexure

member. The description presently on file is silent about a technical effect of locating the second aperture on the centerline, versus locating it off-centerline, like in publication US 2005/0241408 A1.

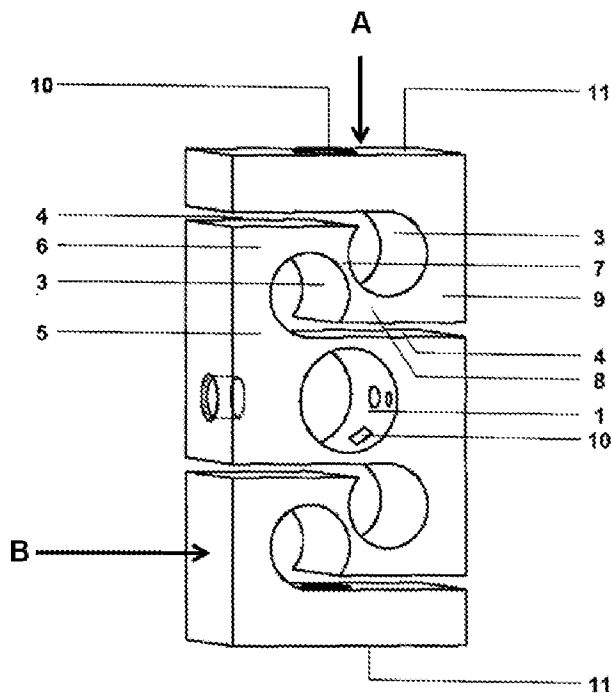
The subject-matter of device **claim 1** does therefore not involve an inventive step (Art. 33(1) and 33(3) PCT) vis-à-vis publications JP 2000 097829 A and US 2005/0241408 A1.

The present application does not meet the requirements of Art. 33(1) PCT, because the subject-matter of device **claim 16** does not involve an inventive step in the sense of Art. 33(3) PCT for the following reasons:

The same reasoning applies as for device claim 1, *mutatis mutandis*.

The subject-matter of device **claim 16** does therefore not involve an inventive step (Art. 33(1) and 33(3) PCT) vis-à-vis publications JP 2000 097829 A and US 2005/0241408 A1.

5.2 - The present application does not meet the requirements of Art. 33(1) PCT, because the subject-matter of dependent **claims 2-15 and 17-19** does not involve an inventive step in the sense of Art. 33(3) PCT. The examining division has added a copy of Fig. 2 of publication US 2005/241408 A1, and added reference signs A and B for further clarification.



**Fig. 2**

- Claims 2 and 14: in the impact sensor body of publication US 2005/0241408 A1, the surface of the flexure member forms part of an inner surface of the primary aperture, see e.g. Fig. 2, lower reference sign 10.
- Claim 3: the skilled person would configure the load cell in publication US 2005/0241408 A1, Fig. 2, such that the impact is on the side indicated with reference sign A, in order to create tensile stresses causing tensile strains on the surface of the flexure member that are parallel with the striking edge with impact on the striking edge.
- Claims 4, 5, 7 and 8: the skilled person would learn from e.g. US 2005/0241408 A1, Fig. 2, that the surfaces can be flat (reference sign 4) or curved (lower reference sign 10)
- Claim 6: the skilled person would configure the load cell in publication US 2005/0241408 A1, Fig. 2, such that the impact is on the side indicated by reference sign B in order to create compressive stresses causing compressive strains on spaced apart surfaces of an inner surface of the primary aperture that are orthogonal to the striking edge with impact on the striking edge.

- Claim 9: in the impact sensor body of publication US 2005/0241408 A1, the strain sensors disposed on the inner surface of the primary aperture having tensile stresses causing tensile strains parallel with the striking edge and/or compressive stresses causing compressive strains orthogonal to the striking edge with impact on the striking edge, see e.g. Fig. 2, lower reference sign 10.
- Claims 10 and 13: in the impact sensor body of publication US 2005/0241408 A1, the strain sensors comprise resistive strain gages, see e.g. paragraph [0006], *a Wheatstone bridge is usually used to produce a signal proportional to the shear force: a Wheatstone bridge is based on a resistance measurement, so a resistive strain gage is implicitly disclosed.*
- Claim 11: capacitive strain gages are common general knowledge.
- Claim 12: sizing a port for signal wires is common general knowledge.
- Claims 15 and 19: at least one pair of the upper and lower surfaces, or the side surfaces are tapered extending rearwardly from the striking edge, 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 design the striking edge (see publication publication JP 2000 097829 A e.g. Fig. 2, reference sign 8).
- Claim 17: in the impact sensor body of publication US 2005/0241408 A1, at least one of the apertures of the plurality of apertures extends between the upper and lower surfaces (see e.g. Fig. 2, reference sign 3).
- Claim 18: at least one of the apertures of the plurality of apertures extends between the side surfaces 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 form a flexure member (see e.g. Fig. 2, reference sign 3).

## **Box VII**

7.1 - R. 6.2(b) PCT - Since the international application contains drawings, the technical features mentioned in the claims shall preferably be followed by the reference signs relating to such features.



7.2 - Independent **claims 1** and **16** are not 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 publication JP 2000 097829 A 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).