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**Datasheet for the decision
of 26 April 2012**

Case Number: T 2138/08 - 3.4.01

Application Number: 04780073.5

Publication Number: 1673636

IPC: G01R 1/073, B25J 9/10

Language of the proceedings: EN

Title of invention:
Test Head Positioning System

Applicant:
inTEST Corporation

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)
RPBA Art. 12(1), 13(1)(3)

Relevant legal provisions (EPC 1973):
EPC Art. 84

Keyword:
"Added subject-matter (yes; Main Request, AR I to IV)"
"Admissibility of late filed requests (no, AR V to VII; yes,
AR VIII)"

Decisions cited:
-

Catchword:
-



Case Number: T 2138/08 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 26 April 2012

Appellant:
(Applicant)

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 26 May 2008
refusing European patent application
No. 04780073.5 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: G. Assi
Members: P. Fontenay
A. Pignatelli

Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division to refuse European patent application No. 04 780 073.5. The decision was based on the grounds that the subject-matter of claim 1 of the main request and auxiliary requests I to III, then pending, defined subject-matter extending beyond the content of the original application (Article 123(2) EPC) and was not new (Article 54 EPC 1973) considering the teaching of document US-A-4 695 024 (D6). This prior art was also considered to anticipate the subject-matter of claim 1 of auxiliary request IV then on file. The decision was dispatched on 26 May 2008.

II. The appellant (applicant) lodged an appeal against this decision by notice filed on 25 July 2008 and paid the prescribed appeal fee on the same day. The written statement setting out the grounds of appeal was filed on 6 October 2008.

With the statement of grounds of appeal, the appellant requested that the decision be set aside and a patent be granted on the basis of the main request or one of the four auxiliary requests I to IV as annexed to the statement of grounds of appeal.

II.a Claim 1 of the main request reads as follows:

"1. An apparatus for manipulating a load, said apparatus comprising:

a first support structure for supporting the load and for sliding said load in a direction along a first range;

a second support structure for supporting the load and for sliding said load independently of said first support structure along a second range; and

a coupling coupled between said first support structure and said second support structure, said coupling including a compliant mechanism for providing a compliant range of motion to the load about a rotative axis where a center of gravity of the load is located away from said rotative axis, said rotative axis being a non-vertical axis,

a source of force for providing force to said load about said rotative axis, said load is also movable about said rotative axis from a further source of force."

Independent claim 11 of the main request relates to a corresponding method of manipulating a load.

II.b Claim 1 of auxiliary request I reads as follows:

"1. An apparatus (1) for manipulating a load, said apparatus comprising:

a first support structure for supporting the load and for sliding said load in a direction along a first range;

a second support structure for supporting the load and for sliding said load independently of said first support structure along a second range; and

a coupling coupled between said first support structure and said second support structure, said coupling including a compliant mechanism for providing a compliant range of motion to the load about a rotative axis where a center of gravity of the load is

located away from said rotative axis, said rotative axis being a non-vertical axis

a source of force for providing force to said load about said rotative axis, said load is also movable about said rotative axis from a further source of force;

another source of force for providing force to said load along said first range or said second range, said load also movable from yet another source of force in

1) said first range if said another source of force provides force to said load along said first range, or

2) said second range if said another source of force provides force to said load along said second range."

Independent claim 11 of auxiliary request I relates to a corresponding method of manipulating a load.

II.c Claim 1 according to auxiliary request II reads as follows:

"1. An apparatus (1) for manipulating a load, said apparatus comprising:

a first support structure for supporting the load and for sliding said load in a direction along a first range of motion;

a second support structure for supporting the load and for sliding said load independently of said first support structure along a second range of motion; and

said second range of motion being different from said first range of motion; and

a coupling coupled between said first support structure and said second support structure, said coupling including a compliant mechanism for providing a compliant range of motion to the load about a first rotative axis so that the load is supported about the rotative axis in a substantially weightless condition where a center of gravity of the load is located away from said first rotative axis, said rotative axis being a non-vertical axis;

and said second support structure supports said load through a range of motion about a second rotative axis which is not parallel to said first rotative axis."

Independent claim 11 of auxiliary request II relates to a corresponding method of manipulating a load.

II.d Claim 1 of auxiliary request III reads as follows:

"1. An apparatus (1) for manipulating a test head (150) for testing integrated circuits by transmitting signals from said test head (150) to said circuits and by receiving signals from said integrated circuits to said test head (150), said apparatus (1) comprising:

a first support structure for supporting the test head (150) and for sliding said test head (150) in a direction along a first range of motion

a second support structure for supporting the test head (150) and for sliding said test head (150) independently of said first support structure along a second range of motion

said second range of motion being different from said first range of motion;

and

a coupling coupled between said first support structure and said second support structure, said coupling including a compliant mechanism for providing a compliant range of motion to the test head (150) about a first rotative axis so that the test head (150) supported about the rotative axis in a substantially weightless condition where a center of gravity of the test head (150) is located away from said rotative axis, said rotative axis being a non-vertical axis."

Independent claim 10 of auxiliary request III defines a corresponding method of manipulating a test head.

II.e Claim 1 of auxiliary request IV reads as follows:

"1. An apparatus for manipulating a load, said apparatus comprising:

a first support structure for supporting the load and for sliding said load in a vertical direction along a first range;

a theta compliance structure (30) coupled to said first support structure through a horizontally rotative attachment which rotates about a horizontal axis, wherein a compliant mechanism is situated between said theta compliance structure (30) and said first support structure in order to a) provide a compliant range of motion to the load about said horizontal axis, and b) limit said range of motion at one end thereof, wherein a center of gravity of the load is rotated away from the horizontal axis;

a second support structure for supporting the load and for sliding said load independently of said first support structure vertically along a second range, theta support structure (30);

a source (325, 340, 731, 732) of liquid, gas, spring or counterweight supplied force for providing force to said load about said rotative axis, said load also movable about said rotative axis from a further source of force."

Independent claim 11 of auxiliary request IV relates to a corresponding method of manipulating a load.

- III. A summons to attend oral proceedings was issued on 16 January 2012 in accordance with a corresponding request of the appellant in the case the Board contemplated taking an adverse decision.
- IV. In a communication dated 31 January 2012 pursuant to Article 15(1) Rules of Procedure of the Boards of Appeal (RPBA), the Board expressed its provisional opinion with regard to the sets of claims then on file. In particular, the attention of the appellant was drawn to the fact that the requirements of Article 84 EPC 1973 and Article 123(2) EPC were not met.
- V. With letter dated 2 April 2012, the appellant filed additional auxiliary requests V, VI and VII intended to overcome the objections brought forward by the Board in its previous communication of 31 January 2012.
- V.a Claim 1 according to auxiliary request V reads as follows:

"1. An apparatus for manipulating a load, said apparatus comprising:

a first support structure (4) for supporting the load and for providing vertical motion to said load in a direction along a first range;

a second support structure (50) for supporting the load and for providing vertical motion to said load independently of said first support structure (4) along a second range;

a theta compliance structure (30) located between said first support structure (4) and said second support structure (50), said theta compliance structure (30) coupled to said first support structure (4) through a horizontally rotative attachment (350a, 350b) which rotates about a horizontal axis so that said second support structure (50) rotates with said theta compliance structure (30) about said horizontal axis, said theta compliance structure (30) providing a variable amount of torque which is equal and opposite to torque applied about the axis by the load in order to provide compliant motion to the load about the horizontal axis, said theta compliance structure (30) including a force adjuster (270a, 270d) to adjust the amount of said torque provided by said theta compliance structure (30)."

Independent claim 9 of auxiliary request V relates to a corresponding method of manipulating a load.

V.b Claim 1 of auxiliary request VI reads as follows:

"1. An apparatus for manipulating a load, said apparatus comprising:

a first support structure (4) for supporting the load and for providing vertical motion to said load in a direction along a first range;

a second support structure (50) for supporting the load and for providing vertical motion to said load independently of said first support structure (4) along a second range;

a theta compliance structure (30) located between said first support structure (4) and said second support structure (50), said theta compliance structure (30) coupled to said first support structure (4) through a horizontally rotative attachment (350a, 350b) which rotates about a horizontal axis so that said second support structure (50) rotates with said theta compliance structure (30) about said horizontal axis, said theta compliance structure (30) transmitting a variable amount of torque which is equal and opposite to torque applied about the axis by the load in order to provide compliant motion to the load about the horizontal axis,

wherein said second support structure (50) is located between said theta compliance structure (30) and said load,

and wherein said torque which is provided by said theta compliance structure (30) is provided from below said horizontal axis."

Independent method claim 9 of auxiliary request VI relates to a corresponding method of manipulating a load.

V.c Claim 1 of auxiliary request VII reads as follows:

"1. *An apparatus for manipulating a load, said apparatus comprising:*

a first support structure (4) for supporting the load and for providing vertical motion to said load in a direction along a first range;

a second support structure (50) for supporting the load and for providing vertical motion to said load independently of said first support structure (4) along a second range;

a theta compliance structure (30) located between said first support structure (4) and said second support structure (50), said theta compliance structure (30) coupled to said first support structure (4) through a horizontally rotative attachment (350a, 350b) which rotates about a horizontal axis so that said second support structure (50) rotates with said theta compliance structure (30) about said horizontal axis, said theta compliance structure (30) providing a variable amount of torque which is equal and opposite to torque applied about the axis by the load in order to provide compliant motion to the load about the horizontal axis, said theta compliance structure (30) including a force adjuster (270a, 270d) to adjust the amount of said torque provided by said theta compliance structure (30),

wherein said second support structure (50) is located between said theta compliance structure (30) and said load."

Independent method claim 8 of auxiliary request VII relates to a corresponding method of manipulating a load.

VI. Oral proceedings before the Board took place on 26 April 2012 in presence of the appellant's

representative. During the oral proceedings an additional auxiliary request VIII was filed.

The single claim of auxiliary request VIII reads as follows:

"1. An apparatus for manipulating a test head (150), said apparatus comprising:

a base (2), a vertical column unit (4), a test head attachment unit (10), guide rails (6) that extend between the column unit (4) and the test head attachment unit (10), and a piston rod (8) extending between the column unit (4) and the test head attachment unit (10);

wherein the piston rod (8) extends from a vertical pneumatic cylinder contained within column unit (4) and provides a vertical range of motion for the test head attachment unit (10);

the vertical column unit (4) supports the test head attachment unit (10) which in turn can support the test head (150);

the column unit (4) is movable in an in-out direction with respect to the base (2) by means of linear rails (9) to provide compliant in-out motion;

the test head attachment unit (10) includes a swing unit subassembly (20), a theta compliance carrier (30), an X-carrier subassembly (40), a vertical carrier subassembly (50), and a cradle subassembly (60) to which the test head (150) can be coupled to or engaged with;

wherein compliant vertical motion and compliant in-out motion are provided by the combination of the column unit (4) and the base (2);

the swing unit assembly (20) is rotatably attached to the column unit (4) by means of a vertical pivot shaft, thus providing compliant rotation about a vertical axis (204);

the theta compliance carrier (30) is attached to the swing unit (20) by a first horizontal axis and can rotate about said first horizontal axis;

the X-carrier subassembly (40) is mounted by means of horizontal rails and linear guide bearings to the theta compliance carrier (30) to provide compliant linear motion in a horizontal direction;

the vertical carrier subassembly (50) is attached to the X-carrier subassembly (40) by means of vertically oriented linear rails, a linear guide bearing, and a lead screw to provide vertical motion;

the cradle subassembly (60) is pivotably mounted to the vertical carrier (50) about a second horizontal axis to provide compliant rotation for the test head (150);

the test head is rotatably attachable to the cradle (60) about a third axis perpendicular to the second horizontal axis, so that the test head (150) is compliantly balanced with respect to this axis."

Reasons for the Decision

1. *Applicable law*

This decision is issued after entry into force of the EPC 2000 on 13 December 2007 whereas the application was filed before this date. Reference is made to the relevant transitional provisions of the EPC 2000, from which it may be derived which Articles and Rules of the

EPC 1973 still apply to pending applications and which Articles and Rules of the EPC 2000 apply. Where the EPC 1973 applies, the citation of Articles or Rules is followed by the indication "1973" (cf. EPC, citation practice).

2. The appeal complies with the requirements of Articles 106 to 108 EPC and Rule 99 EPC. It is, thus, admissible.

3. *Main request - Auxiliary requests I to IV*

In the following, references to the original disclosure apply to the published PCT application WO-A-2005/015245.

3.1 The references in claim 1 of the main request and auxiliary requests I to IV to a first support structure for supporting the load (or the test head - auxiliary request III) and for sliding said load (test head) in a direction along a first range of motion, or to a second support structure for supporting the load (test head) and for sliding said load (test head) independently of said first support structure along a second range of motion lead to subject-matter extending beyond the content of the original application because of the use of the term "*sliding*".

It is, firstly, observed that this term does not necessarily imply the use of a guide rail, contrary to the view put forward by the appellant. Therefore, the subject-matter of claim 1 of the main request and auxiliary requests I to IV constitutes a generalisation of the embodiment actually disclosed in the present

description which solely depicts support structures moving along guide rails. As illustration of this situation, it is noted that a mere planar surface on which an object can move, without rolling, can be considered to constitute a support structure for sliding the object.

Secondly, a further generalisation of the original disclosure derives from the fact that the recited effect of sliding the load, or test head, also encompasses configurations in which the load would be intimately associated to both or one of the two support structures, for example, through direct contact between the support structure and the load or test head for which no basis can be identified in the original application documents. It is stressed, in this respect, that the original disclosure describes a very specific construction in which the load is supported and translated by a combination of various parts including *inter alia* a swing unit, a theta compliance carrier and a cradle subassembly. The appellant did not comment on this issue.

3.2 A similar objection applies to the independent method claim of the main request and auxiliary requests I to IV.

3.3 Consequently, the independent apparatus and method claims of the main request and auxiliary request I to IV contain new subject-matter contrary to Article 123(2) EPC. The main request and auxiliary requests I to IV are therefore not allowable.

4. Auxiliary requests V to VII

4.1 In accordance with Article 12(1) RPBA, appeal proceedings shall be based *inter alia* on the notice of appeal and the statement of grounds of appeal. Under Article 13(1) RPBA, a board has, however, the discretion to admit and consider new requests presented by the appellant after it has filed its grounds of appeal. The discretion shall be exercised in view of *inter alia* the complexity of the new subject matter submitted, the current state of the proceedings and the need for procedural economy.

In this respect, a criterion commonly applied by the boards of appeals consists in determining whether the new requests overcome outstanding objections under the EPC and do not give rise to new objections (cf. Case law of the Boards of Appeal, 6th Edition, 2010, VII.E, sections 16.4 and 16.5).

4.2 Under the present circumstances, since none of the apparatuses defined in claim 1 of auxiliary requests V to VII include all the essential features actually required in order to solve the problem of the invention, i.e. to provide compliant motion in each of the load's or test head's six degrees of motion (cf. page 1, lines 11-16; page 3, lines 7-15 of the published application), the requirements of Article 84 EPC 1973 are not met.

Furthermore, the reference to a theta compliance structure in claim 1 of auxiliary requests V to VII, in combination with the features of the two support structures, without however incorporating the other

parts of the manipulator actually disclosed in the original application (cf. pages 8 and 9; Figures 3 and 4), constitutes a generalisation of the sole embodiment actually disclosed. Since the original disclosure does not provide any basis for such a generalisation, claim 1 of auxiliary requests V to VII define new subject-matter extending beyond the content of the application as filed in violation of Article 123(2) EPC.

- 4.3 In the letter of 2 April 2012 accompanying requests V to VII, the appellant referred to various passages of the original disclosure which, in its view, constituted a basis under Article 123(2) EPC for the feature of the theta compliance structure as recited in claim 1 of said auxiliary requests. However, neither in said letter nor during the oral proceedings before the Board did the appellant comment on the absence in the claims of the other constituents of the disclosed manipulator.

Concerning the issue of clarity under Article 84 EPC 1973, the Board concurs with the appellant that the amendments carried out in claim 1 of auxiliary requests V to VII do address the shortcoming resulting from the theta degree of compliant freedom being lost, explicitly acknowledged on page 3, line 2 of the specification. This argument is however not sufficient to convince the Board that the requirements of Article 84 EPC 1973 are met since it does not address the actual problem solved by the invention, that is to provide compliant mobility with respect to 6 degrees of freedom (cf. page 1, lines 11-16; page 3, lines 7-15), but merely focuses on one of its aspects.

- 4.4 Consequently, the Board decides not to admit auxiliary requests V to VII in the appeal proceedings.
5. Auxiliary request VIII
- 5.1 Requests filed during oral proceedings can be admitted under Article 13(1) and (3) RPBA, if they don't raise issues which the Board cannot reasonably be expected to deal with without adjournment of the oral proceedings.
- 5.2 The sole claim of auxiliary request VIII reproduces, in essence, the passage of the description on page 8, line 3 to page 9, line 32, of the application as published. This passage relates to Figures 3 and 4 of the application. It constitutes a complete description of the sole embodiment of the manipulator according to the invention and depicts all its constitutive elements as well as the nature of the links existing between them. The Board is thus satisfied that the requirements of Article 123(2) EPC are met.
- 5.3 By specifying how the constituents of the claimed manipulator are attached and thus cooperate with each other, the claim's wording permits to establish which relative motions (translations or rotations) between said elements are indeed rendered possible. The skilled reader would therefore recognise that the claimed manipulator indeed allows that the test head be moved both linearly and rotationally with respect to the various axes of space. The condition that an independent claim should recite all features actually required to solve the technical problem of the invention is thus met (Article 84 EPC 1973).

5.4 In conclusion, the Board is in a position to immediately acknowledge that the outstanding issues of added subject-matter and clarity have been overcome by auxiliary request VIII.

The Board hence decides to admit auxiliary request VIII in the appeal proceedings, despite its late filing. Since the claim according to auxiliary request VIII differs substantially from the original claims and refers to subject-matter which has possibly not been searched, the case is remitted to the examining division in order for it to decide on the patentability requirements of the claimed subject-matter (Article 111 EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance department for further prosecution on the basis of the single claim of auxiliary request VIII filed at the oral proceedings before the Board.

The Registrar:

The Chairman:

R. Schumacher

G. Assi