Examiners' Report Paper A 2014 (Electricity/Mechanics)

1. General considerations

In the following, the abbreviation GL refers to the Guidelines For Examination in the European Patent Office in the version valid at the time of the examination.

1.1. Introduction

This year's paper relates to nutcrackers. According to the client's letter (par. [001]), the nutcrackers of the invention can crack nuts of different sizes, such as walnuts and hazelnuts. The client's letter describes two examples of nutcrackers. The first example is shown in conjunction with Figs. 1 to 6. The second example is shown in conjunction with Figs. 7 to 11. The client's letter describes several embodiments for each example.

1.2. Prior Art

1.2.1 In the letter (par. [023]), the client refers to a prior art document D1. Like the example nutcrackers described in the client's letter, D1 uses a lever effect to enable nuts to be cracked without exercising too much force.

The nutcracker of D1 has two elongate lever arms 4 and 5 connected to each other by connecting elements 1, 2 and 3. The connecting elements 1 and 2 are straight, whereas the connecting element 3, which is arranged between the connecting elements 1 and 2, is curved. The lever arms 4 and 5 are pivotally attached at respective ends of the connecting elements 1, 2 and 3.

To crack a nut with the nutcracker of D1, the nut is first placed in a space defined by the lever arms 4, 5 and the connecting elements 1, 2, 3. The lever arm 5 is then pushed towards the lever arm 4 until it comes into contact with the nut, thereby restricting the space. By further pushing the lever arm 5 towards to lever arm 4, the space is further restricted until the nut is eventually cracked by the lever arms 4, 5 and the connecting elements 1, 2, 3.

According to D1 (par. [004]), different nutcrackers with connecting elements of different lengths have to be used for optimally cracking nuts of different sizes, such as walnuts and hazelnuts.

1.2.2 The client also refers to a prior art document D2 (par. [023]).

The nutcracker of D2 consists of two blocks 1 and 2 and four circular rods 3 to 6. The rods 3 to 6 are attached to the blocks 1 and 2 in that they can rotate in circular through-holes in the blocks and are connected two by two by four strips 7, 8, 10 and 11. Rings 9 and 12 are attached to the strips 8 and 10.

To crack a nut with the nutcracker of D2, the nut is first placed on the rods 3, 4 and 5 in a space defined by the blocks 1, 2 and the rods 3 to 6. By abruptly pulling the rings 9 and 12 apart from each other, the rods 3 and 6 are pulled in a first direction, whereas the rods 4 and 5 are pulled in a second direction opposite to the first direction. The strip 11 pushes the block 1 in the first direction, the strip 7 pushes the block 2 in the second direction. This results in said space being restricted until the blocks 1 and 2 come into contact with the nut. Due to the momentum of the block 1 and 2, the space is further restricted and the nut is eventually cracked by the blocks.

It results from the above that the nutcracker of D2 uses the momentum of the blocks 1 and 2 to crack a nut and not a lever effect.

The nutcracker of D2 can crack nuts of different sizes, such as walnuts and hazelnuts (par. [005]). However, with the nutcracker of D2, skill is needed to crack nuts without completely crushing them (par. [023] of the client's letter).

1.3. Challenges of the Paper

The client describes two types of nutcracker as two examples of the invention. A first example of a nutcracker is described in conjunction with Figs. 1 to 6. A second example of a nutcracker is described in conjunction with Figs. 7 to 11. The client's letter further defines several embodiments for each example.

The client wishes to protect both examples in a European patent application.

In the first example (Figs. 1 to 6), two plates 1 and 2 are connected by three rods 3-5. The rods 3-5 are attached to the plates 1 and 2 by means of ball-joints. To crack a nut, the nut is inserted into the space defined by the plates 1, 2 and the rods 3-5. The plates 1 and 2 are then rotated relative to each other. This causes the rods 3-5 to move relative to each other so as to restrict said space. The nut is thereby squeezed by the rods 3-5. By further restricting the space, the nut is eventually cracked by the rods 3-5.

In the second example (Figs. 7 to 11), two plates 1 and 2 are connected by four rods 3-6. The rods 3-6 are attached to the plates 1 and 2 by means of hinges. To crack a nut, the nut is inserted into the space defined by the plates 1, 2 and the rods 3-6. The plates 1 and 2 are then moved relative to each other. This causes each rod 3-6 to rotate with respect to the plates 1 and 2, whereby all rods remain parallel to each other. Each rod 3-6 moves relative to two of the other rods and does not move relative to one of the other rods. This has the effect of restricting said space. The nut is thereby squeezed by the rods 3-6 and one of the plates 1, 2. By further restricting the space, the nut is eventually cracked by the rods 3-6 and one of the plates 1, 2.

In every embodiment of the examples of the invention, two plates are each attached to rods. According to the client's letter, at least three rods are necessary in each embodiment of the examples (par. [010] and [021]). The plates and the rods define a space (par. [002]). In all embodiments, the rods are rotatable with respect to the plates. By moving the plates relative to each other, the rods rotate with respect to each plate. In the first example, each rod moves relative to the other rods. However, in the second example, each rod moves relative to two rods while it does not move relative to another rod. The movement of the rods as a whole restricts the space defined by the plates and the rods. It follows that a nut initially inserted into the space can be cracked by the rods (first example) or a plate and the rods (second example) if the space is restricted enough by the relative movement of the plates.

At least in the first example, other support elements than plates can be used to support the rods (par. [011]). In both examples, other connecting elements than rods can be used to connect the plates (par. [022]).

1.4. The Marking Scheme

Answer papers are awarded marks on a scale of 0 to 100 marks:
up to **50 marks** are available for an independent claim,
up to **35 marks** are available for a set of dependent claims, and
up to **15 marks** are available for the introductory part of a description.

2. Independent claim (up to 50 marks available)

Generally it is noted that the marks awarded for an independent claim reflect the degree to which the claim achieves protection for the client’s invention in its broadest possible scope.

This year, the only independent claim expected was a device category claim to a nutcracker.

Where an answer paper has an additional independent claim in a different category, e.g. a method of cracking a nut, 50 marks are available for the independent device claim and **no marks** are available for the independent claim in the other category.

Answer papers having multiple independent claims in the device category which attempt to cover different embodiments of the invention (e.g. the example shown in Figs. 1-6 on the one hand and the example shown in Figs. 7-11 on the other hand) can achieve **up to 35 marks** for the independent claims in total, because it is considered that the invention can be appropriately claimed with a single independent device category claim.

Other cases are considered on a case-by-case basis.

This year, separate applications are not expected and no marks are foreseen for them.

2.1. Example Solution

Example feature set as a basis for an example independent claim:

(a) Nutcracker comprising

(b) two support elements,

(c) at least three connecting elements,

(d) each connecting element being attached to each of the support elements,

(e) the support elements and the connecting elements defining a space for receiving a nut,

(f) each connecting element being moveable with respect to each support element

(g1) such that a movement of one of the support elements relative to the other support element causes at least one of the connecting elements to move relative to another of the connecting elements

(g2) so that the space is restricted in order to crack a nut received in the space.

2.2. Equivalent/Non-equivalent wording of example solution

In the following notes, remarks are made to features of the example solution. An "equivalent" indicates a different wording for a given feature that can achieve the same number of marks as the wording given in the example solution. It is not intended to indicate that the wording itself necessarily has exactly the same meaning as the wording of the example solution. A "non equivalent" indicates a different wording for a given feature that does not achieve the same number of marks as the wording given in the sample solution.

Remarks to feature (a)

Equivalents: *Device for cracking a nut*; *Device for cracking nuts of different sizes; Device for cracking an object; Device*.

Non equivalents: *Device for cracking a walnut and/or a hazelnut*: unnecessary limitation (see 2.3.3); *Device for cracking any nut (*or *nuts of any size)*: unnecessary limitation (see 2.3.3)

Remarks to feature (b)

Equivalents: *Two supports*; *Two support members*; *Two elements; Two handles*.

Non equivalents: *Two plates*; *Two cubes*: unnecessary limitations (see 2.3.1 and 2.3.2). *Upper element and lower element*: lack of clarity (see 2.6.3).

Remarks to feature (c)

A claim failing to define at least three connecting elements runs the risk of lacking novelty or inventive step, in particular with respect to D2 (see 2.4).

Equivalents: *three connecting elements*; *three linking elements; at least three elements*; *at least three connectors*; *at least three connecting members*; *at least two connecting elements* (provided the claim as a whole achieves novelty and inventive step); *three elongated connecting elements*.

Non equivalents: *at least three rod*s: unnecessary limitation (see 2.3.2); *at least three tubes*: unnecessary limitation (see 2.3.1).

Remarks to feature (d)

Features (d) and (f) can be grouped in a single feature, e.g. *"movably attached"* or *"rotatably attached"* or *"pivotably attached"*.

Equivalents: "*connected*", *"coupled"* or *supported"* instead of "*attached*"; (d) + *by means of attachment means;* (d) + *by means of joints* (or *joining means*);

Non equivalents: (d) + *by means of ball-joints;* (d) + *by means of hinges*: unnecessary limitations (see 2.3.1).

Remarks to feature (e)

Feature (e) can be left out if feature (g2) reads "*so that the (shortest) distance between at least two of the connecting elements decreases to crack a nut placed between the connecting elements*" or "*so that at least two of the connecting elements get closer to each other to crack a nut placed between the connecting elements*".

Equivalents: "*cage*" or "*volume*" instead of "*space*"; leaving out "*the support elements*"; leaving out "*for receiving a nut*" if no nut is mentioned elsewhere in the claim; *the connecting elements defining a space between the support elements*; *the connecting elements defining a space for receiving a nut*.

Non equivalents: leaving out "*the connecting elements*": lack of clarity (see 2.6.3).

Remarks to feature (f)

Features (d) and (f) can be grouped in a single feature, e.g. *"movably attached"* or *"rotatably attached"* or *“pivotably attached”*.

Equivalents: "*rotatable*" or “*pivotable*” instead of "*movable*"*.*

Non equivalents:

Remarks to feature (g1)

A movement of one of the at least two connecting elements relative to another of the connecting elements provides novelty over D1 (see 2.4.1).

(g1) + "so that the space is restricted" provides novelty over D2 (see 2.4.2).

Equivalents:
- “*a relative movement of* (or *between*) *the support elements*” or "*a relative rotation of the support elements*" instead of "*a movement of one of the support elements relative to the other support element*";
- "*[...] causes one of (*or *at least one of) the connecting elements to move relative to at least one of the other connecting elements“* or *“[...] causes a relative movement of at least two of the connecting elements”* or *“[...] causes one of (*or *at least one of) the connecting elements to move relative to other connecting elements*" instead of *“[...] causes at least one of the connecting elements to move relative to another of the connecting elements”*;
- leaving out the relative movement of the connecting elements is possible provided that the space is properly defined as the space between the connecting elements.

Non equivalents:
- "*[...] causes one of (*or *at least one of, each of) the connecting elements to move relative to (each of)* ***the*** *other connecting elements*" or "*[...] causes a relative movement of one of (*or *at least one of,* or *each of) the connecting elements relative to (each of)* ***the*** *other connecting elements*" instead of *“[...] causes at least one of the connecting elements to move relative to another of the connecting elements”*: unnecessary limitation (see 2.3.1);
- "*[...] causes the connecting elements to move relative to each other*" or *"[...] causes a relative movement of the connecting elements"* instead of *“[...] causes at least one of the connecting elements to move relative to another of the connecting elements”*: lack of clarity (see 2.6.2).

Remarks to feature (g2)

Equivalents: "*reduced*", “*limited*” or "*decreased*" instead of "*restricted*"; leaving out "*to crack a nut received in the space*".

Non equivalents:

2.3. Unnecessary Limitations (up to -50 marks)

Unnecessary limitations in independent claims are considered to be features that: a) are unnecessary for defining the client's invention in its broadest possible scope; and b) disadvantage the client by limiting the scope of the claim.
An unnecessary limitation may for example result in the exclusion of protection for one of the examples of the invention discussed in the client's letter.

If a feature of a claim is unclear so that it is ambiguous as to whether or not the claim is unnecessarily limited by that feature, then this is considered under the section lack of clarity (see 2.6) and not in this section.

2.3.1 Where a claim is unnecessarily limited to the extent that one of the two examples specifically illustrated in Figs. 1-6 and 7-11 of the client's letter is not covered by the claim, then 30 marks are deducted for each example which is not covered.

Examples:

A. The support elements are limited to **cubes** (-50 marks for excluding the examples of Figs. 1-11);

B. The connecting elements are limited to **tubes** (-50 marks for excluding the examples of Figs. 1-11);

C. (d) + by means of **ball-joints** (-30 marks for excluding the example of Figs. 7-11);

D. (d) + by means of **hinges** (-30 marks for excluding the example of Figs. 1-6);

E. a claim based on the example solution, wherein in feature (g1) "*[...] causes one of (*or *at least one of, each of) the connecting elements to move relative to (each of) the other connecting elements*" or "*[...] causes a relative movement of one of (*or *at least one of,* or *each of) the connecting elements relative to (each of) the other connecting elements*" replaces *"[...] causes at least one of the connecting elements to move relative to another of the connecting elements"* (-30 marks for excluding the example of Figs.7-11)

2.3.2 Independent claims having all the features of the example solution claim and at least one additional feature in accordance with the following examples are considered to be unnecessarily limited. Marks are deducted for claims using the following examples as a reference.

A claim having all features of the example solution additionally defining:

F. that the support elements are limited to **plates** (-20 marks for excluding the embodiments having another type of support element, e.g. cubes - see par. [011]);

G. that the connecting elements are limited to **rods** (-10 marks for excluding the embodiments having another type of connecting element, e.g. tubes - see par. [022]).

H. Defining a connecting element as being attached to a support element at its **end** (-20 marks for excluding the embodiment of [022], first and second sentences).

I. Defining that the connecting elements have the same **length** (-20 marks for excluding the embodiment of [010], penultimate sentence).

J. Example solution claim further defining that both support elements remain **parallel** (-10 marks, as this is not necessarily the case in the example of Figs. 1-6).

2.3.3 Other features present in all embodiments of the two examples but considered to be unnecessary for defining the invention lead to a deduction of fewer marks.

A claim having all features of the example solution additionally defining:

K. that the device is for cracking a walnut and/or a hazelnut (-5 marks, as walnuts and hazelnuts are only two examples of nuts);

L. that the number of connecting elements is limited to three to five in number (- 10 marks for excluding more connecting elements);

M. A device for cracking any nut (or nuts of any size): -10 marks.

2.3.4 A claim having all features of the example solution further defining any additional feature(s) of the following examples being not considered as being limited, no marks are deducted.

N. the connecting elements are **rotatably (or pivotably)** attached to each of the support elements (-0 mark);

O. the relative movement of the support elements causes a rotation of the connecting elements relative to the support elements (-0 mark);

P. the means for attaching the connecting elements to the support elements are not aligned (or form a polygon) (-0 mark)

Q. the nut is first squeezed and then cracked (-0 mark).

R. the support elements and/or the connecting elements are made of a stiff material (-0 mark).

2.4. Lack of Novelty (-30 marks)

An independent claim that is considered to lack novelty with regard to any of the available prior art loses 30 marks.

2.4.1 The following is noted regarding the document D1:

D1 discloses a nutcracker comprising
- two support elements (lever arms 4 and 5),
- at least three connecting elements (connecting elements 1, 2 and 3),
- each connecting element being attached to each of the support elements (by means of pins 6 and 7),
- the support elements and the connecting elements defining a space for receiving a nut (see eighth sentence of par. [001] and first sentence of par. [003]),
- each connecting element being moveable with respect to each support element (see fifth sentence of par. [001]),
- whereby a relative movement of the support elements causes ~~a relative movement of at least two of the connecting elements so that~~ the space [to be] restricted in order to crack a nut received in the space (see third and fourth sentences of par. [003]).

In D1, the three connecting elements do not move relative to each other (see seventh sentence of par. [001]). The three connecting elements are pivotably movable with regard to (relative to) the support elements (see Figs. 2-4).

The nutcracker of D1 is suitable for cracking nuts of different sizes, e.g. walnuts and hazelnuts. However, it is not suitable for optimally cracking walnuts and hazelnuts (see par. [004]).

In D1, the joints for attaching each connecting element 1-3 to a support element (lever arm 4 or 5) are aligned, i.e. they do not form a triangle or a polygon.

In D1, a nut is squeezed, and cracked, by the connecting elements 1, 2 and 3.

2.4.2 The following is noted regarding the document D2:

D2 discloses a nutcracker comprising

- two support elements (blocks 1 and 2),
- at least three connecting elements (rods 3-6),
- each connecting element being attached to each of the support elements (by means of strips 7, 8, 10 and 11 - see third sentence of par. [002]),
- the support elements and the connecting elements defining a space for receiving a nut (see first sentence of par. [003]),
- each connecting element being moveable with respect to each support element (see last sentence of par. [001]).

a) In D2, to crack a nut, a relative movement of some of the ~~support~~connecting elements (rods 3-6) causes a relative movement of ~~at least two of~~ the ~~connecting~~support elements (blocks 1, 2) so that the space is restricted in order to crack a nut received in the space (see par. [003]).

b) In D2, to remove a cracked nut from the nutcracker, a relative movement of the support elements (blocks 1, 2) causes a relative movement of at least two of the connecting elements (e.g. rods 3 and 4) so that the space is ~~restricted~~enlarged in order to ~~crack~~remove a nut received in the space (see par. [004]).

It results from a) and b) above that D2 does not anticipate the combination of features (g1) and (g2).

The nutcracker of D2 is suitable for cracking nuts, e.g. walnuts, of different sizes. It is also suitable for cracking walnuts and hazelnuts.

In D2, the distance between any pair of rods 3-6 always remains constant.

In D2, rods 3-6 are attached to blocks 1, 2 (see [002], third sentence). It follows that rods 3-6 are attached to blocks 1, 2 by means of joints. However, D2 does not show any ball joint or hinge.

In D2, rods 3-6 can rotate relative to blocks 1, 2. Rods 3-6 cannot pivot relative to blocks 1, 2.

According to an alternative reading of D2, D2 discloses a nutcracker comprising
- two support elements (e.g. rods 4 and 5),
- at least ~~three~~ **two** connecting elements (blocks 1 and 2),
- each connecting element being attached to each of the support elements (by means of strips 7, 8, 10 and 11 - see third sentence of par. [002]),
- the support elements and the connecting elements defining a space for receiving a nut (see first sentence of par. [003]),
- each connecting element being moveable with respect to each support element (see last sentence of par. [001]),

- whereby a relative movement of the support elements causes a relative movement of at least two of the connecting elements (see second and third sentences of par. [003])
- so that the space is restricted in order to crack a nut received in the space (see last sentence of par. [003]).

It follows that D2 anticipates a claim based on the example claim in which in feature (c) "three connecting elements" is replaced by "**two** connecting elements".

2.4.3 If, due to an unclear formulation, there are doubts as to whether or not the wording of a claim could be read onto a piece of the prior art, then such claims are considered under lack of clarity (see 2.6), not under lack of novelty.

Claims which are novel over the available prior art, but do not comprise all the features of the example solution are assessed on a case-by-case basis, and are typically considered under Inferior Solutions (see 2.8).

2.5. Lack of Inventive Step (up to -25 marks)

An answer paper having a single independent claim whose subject-matter is considered to lack an inventive step in the light of the available prior art loses 25 marks.

2.6. Lack of Clarity (up to -30 marks)

Up to 30 marks in total can be deducted in this section. The full deduction of 30 marks is applicable where the sum of all clarity issue deductions adds up to 30 marks or more.

2.6.1 Claims defined in terms of a result to be achieved

Claims which attempt to define the invention in terms of a result to be achieved lose marks under lack of clarity irrespective of whether or not the claim additionally loses marks due to lack of novelty.

Example:

- Nutcracker based on lever effect and suitable for cracking walnuts and hazelnuts (-30 marks for claiming a mere wish).

2.6.2 Unclear definition of the movement of the three connecting elements

As soon as at least three connecting elements are defined, their relative movement has to be clearly defined. This is even more essential, as this is in general the feature providing novelty and inventive step over D1. Furthermore, an

unclear definition may lead to an exclusion of the second example (Figs. 7-11) - see 2.3.1.

Examples:

- Claims lacking clarity as to whether each connecting elements moves relative to each other connecting element (up to -15 marks), e.g.:

    - a claim based on the example claim in which feature (g1) would be replaced by "*a relative movement of the support elements causes a relative movement of the connecting elements"* (-15 marks).

    - a claim based on the example claim in which feature (e) is left out and feature (g2) reads "*so that the (shortest) distance between the connecting elements decreases to crack a nut placed between the connecting elements*" or "*so that the connecting elements get closer to each other to crack a nut placed between the connecting elements*" (-15 marks).

- Claims in which the causality of movement (see “causes” in example claim) is missing (up to -15 marks), e.g.

    - a claim based on the example claim in which feature (g1) would be replaced by “such that the support elements are rotatable relative to each other and at least one of the connecting elements is moveable relative to another of the connecting elements” (-15 marks).

2.6.3 Other Clarity Issues

- a claim novel over D1 merely by defining that joints for attaching connecting elements to a support element are not aligned (or that they form a triangle or a polygon) lacks clarity, as it does not define how cracking can be performed (-15 marks).

- leaving out "*the connecting elements*" in feature (e) leads to an unclear definition of the space. In each example of the invention the rods participate in holding and cracking the nut (-10 marks).

- leaving out "*the support elements and*" in feature (e) is not considered a lack of clarity (-0 mark).

- example solution claim + defining that the connecting elements are rotatable about an axis perpendicular to a support element (or perpendicular to a plane defined by a support element), as a support element does not clearly define a plane and an axis (-15 marks).

- “Upper and lower support elements” instead of “two support elements” in the example solution claim: -5 marks for using relative terms.

Other minor issues of lack of clarity lose up to 5 marks per feature.

Examples:

- claiming a device in use (-5 marks).

- example solution + defining that at least two of the connecting elements are separated by a gap for inserting the nut into the nutcracker (-5 marks, for not clearly defining the size of the gap).

2.7. Formal Matters (up to -5 marks)

2.7.1 For the example solution it is considered appropriate to use a two-part form of claim. However, using a one-part form is not penalised. An incorrect two-part form with respect to any of the items of prior art mentioned in the client’s letter leads to a deduction of 3 marks.

2.7.2 The total absence of reference signs in the claims results in a deduction of 2 marks.

Partially incorrect or very incomplete reference signs in the claims results in a deduction of 1 mark.

2.8. Inferior Solutions (up to 30 marks available)

An independent claim which is considered to be an inferior solution is a claim which:
- offers a less favourable scope of protection for the client than the example solution claim, for example because it is contrary to the client’s wishes;
- misses at least one feature of the example independent claim;
- has at least one feature that is not in the example independent claim; **and**
- is new and arguably not obvious with respect to the available prior art.

3. Dependent claims (up to 35 marks available)

Generally it is noted that the marks awarded for a dependent claim reflect the degree to which the claim offers a fall-back position for the client, taking into consideration the independent claim or claims and the prior art available. No marks are awarded for any claims subsequent to a 15th claim, since the client states that claim fees will not be paid.

3.1. Structure

3.1.1 Important requirements for awarding full marks are:

- **clarity**, e.g. consistency of terminology with the independent claim;
- claim **structure**, a set of dependent claims having a structure which gives the client an appropriate set of fall-back options whilst at the same time being concise and having claims with correct back-references is considered to have a good structure.

3.1.2 As a general rule, where a feature A is unnecessarily limited in a set of dependent claims, by grouping it together with a feature B, the full potential of a fall-back position for features A and B is not achieved. The number of marks available for a claim combining features A and B corresponds to the number of marks achieved either by a claim to feature A or a claim to feature B, whichever is lower.

Example:

Dependent claims 2 and 3 depending on the example solution independent claim, and having the wording:
“2. A device according to claim 1, further characterised by feature X (2 marks).
“3. A device according to claim 1 (and/or claim 2), further characterised by feature Y” (1 mark).

In this case the total obtained for the two features in claims 2 and 3 is 3 marks. However, the above features claimed together in a single claim and not claimed as options, give the client a more limited fall-back position:

"2. A device according to claim 1, having features X and Y" (1 mark)

3.1.3 Where an answer paper has an independent claim which differs from that of the example solution, the dependent claims may differ from the example dependent claims. This is considered on a case-by-case basis, considering the value of the dependent claims in the light of the independent claim.

3.2. Example feature set

In this section, an example feature set is defined which could have been used to formulate good dependent claims for an independent claim corresponding to the example solution discussed above. In the example feature set, groups of features for dependent claims are defined, each relating to a specific aspect of the invention. The marks available for each of these groups is indicated. It is however noted that there are different ways of grouping features in dependent claims whilst still achieving the full number of available marks. An example set of claims is attached in annex (see 5).

Size of the nutcracker (**up to 3 marks**)

… For cracking walnuts and hazelnuts (**up to 3 marks**)

[for cracking nuts of different sizes (up to 1 mark)]

Support elements (**up to 8 marks**)

… support elements are plates or cubes (**up to 2 marks**)

… at least one of the support elements has a through-hole to insert the nut into the space (**up to 3 marks**)

[at least one of the support elements has a through-hole to insert the nut (up to 3 marks)]
[the support elements have a through-hole to insert the nut (up to 2 marks)]
[at least one of the support elements has a through-hole (up to 1 mark)]
[the support elements have a through-hole (up to 1 marks)]

… at least one of the support elements has a handle to form a lever arm (**up to 3 marks**)

[the support elements have handles to form lever arms (up to 2 marks)]
[at least one of the support elements has a handle (up to 2 marks)]
[the support elements have handles (up to 1 marks)]

Connecting elements (**up to 14 marks**)

… the connecting elements are rods or tubes (**up to 2 marks**)

… the connecting elements have the same length (**up to 3 marks**)

[the connecting elements have different lengths (up to 3 marks)]

… the connecting elements are four or five in number (**up to 2 marks**)

[the connecting elements are at least four in number (up to 2 marks)]
[the connecting elements are four (or five) in number (up to 1 mark)]

… the connecting elements are provided with ridges, protrusions or non-slip paint (**up to 3 marks**)

[the connecting elements are provided with ridges, protrusions or non-slip paint to prevent the nut from jumping out of the nutcracker (up to 3 marks)]

… at least one of the connecting elements is attached to a support element at one of its ends (**up to 2 marks**)

[at least one of the connecting elements is attached to a support element elsewhere than at one of its ends (up to 2 marks)]

[the connecting elements are attached to a support element elsewhere that at one of their ends (up to 1 mark)]
[the connecting elements are attached to the support elements elsewhere that at one of their ends (up to 1 mark)]

… attachment means (or ball-joints) equally spaced from each other and/or from the centre of one of the support elements (**up to 2 marks**),

Specific to first example (**up to 5 marks**)

… the connecting elements are attached to the support elements by means of ball-joints (**up to 4 marks**)

…. a relative movement of the support elements causes a movement of each of the connecting elements relative to all the other connecting elements (**up to 1mark**)

Specific to second example (**up to 5 marks**)

… the connecting elements are attached to the support elements by means of hinges (**up to 4 marks**)

…. a relative movement of the support elements causes a movement of each of the connecting elements relative to only one or only some of the other connecting elements (**up to 1 mark**)

3.3. Other dependent claims offering a useful fall-back (up to 5 marks)

3.3.1 Claims considered to offer a useful fall-back position (up to 5 marks)

Up to **5** marks in total are available for one or more additional dependent claims which offer a useful fall-back position or positions, provided the total of **35** marks for the dependent claims is not exceeded. The dependent claims appropriate for achieving fall-back positions may depend on the independent claim.

For example, if an answer paper has an independent claim to a device which is **not new** with respect to D2 because feature (g2) is missing, a dependent claim to this feature is an important fall-back position for the applicant (**5 marks**).

Examples of dependent claims for the example independent claim:

... the hinges are located at corners of one of the support elements (up to 2 marks),

... one of the support elements is configured to be fixed on a surface (or on a table top (up to 2 marks),

[one of the support elements can be fixed to a surface, e.g. a table top (0 mark)]

... the connecting elements remain parallel to each other (up to 1 mark),

... the plates (or support elements) **rotate** relative to each other if a relative **movement** of the plates (support elements) is already properly defined in the independent claim (up to 2 marks),

3.3.2 Claims considered not to offer a useful fall-back position

Dependent claims which are considered not to offer a useful fall-back position for the client are **not** awarded marks.

Examples for the example independent claim are:

... any detail of a ball-joint or a hinge,

... the support elements and/or the connecting elements are made of a stiff material

... plates (or support elements) in form of a disk or a rectangle,

... the rods (or connecting elements) are identical,

... the rods (or connecting elements) **rotate** relative to each other if a relative **movement** of the rods (connecting elements) is already properly defined in the independent claim,

... at least two of the connecting elements are separated by a gap,

... defining a cage if a space is already properly defined in the independent claim,

... a table comprising a nutcracker according to a previous claim

4. Description (15 marks available)

4.1. For an **acknowledgement of prior art**, **5 marks** are available. Full marks in this section are available for citing a single piece of prior art and explaining it. When the independent claim is constructed in the two-part form, full marks are available for a brief explanation of the cited prior art. When the independent claim is constructed in the one-part form, full marks are only awarded in this section for a citation of a piece of prior art and explanations from which it is derivable which of the features claimed in the independent claim are known from the cited prior art (see GL F-IV, 2.3.2).

4.1.1 For the example solution independent claim, D1 is considered more relevant than D2. D1 is based on a lever effect, like the examples of the client's letter, whereas D2 uses a momentum to crack a nut. Furthermore, even if the example independent claim has less features in common with D1 than with D2 (when considering in D2 how a nut is removed from the nutcracker), D1 shows a relative movement of support elements causing a movement of connecting elements (a feature not present in the nutcracker of D2 when it is used to crack a

nut). Consequently, D1 is considered a more promising starting point when arguing lack of inventing step of the example independent claim.

4.1.2 For a claim according to the example solution independent claim it is appropriate to cite D1 (2 marks) and explain its content (up to 3 marks).

4.1.3 For the example solution independent claim, merely citing D1 without describing its technical content receives 2 marks.

4.1.4 For the example solution independent claim, a citation of D2 and explanation of its content receives up to 3 marks.

4.1.5 For the example solution independent claim, a mere citation of D2 without describing its technical contents receives 1 mark.

4.2. A total of **4 marks** are available for a **discussion of a problem**. To receive all the marks available, the problem should be consistent with the prior art acknowledged and with the independent claim of the answer paper. In principle, general problems such as "making a device more practical to use" should not receive any marks.

4.2.1 For the example solution independent claim, a definition of a problem with respect to D1 can be as follows: The length of the connecting elements of the nutcracker disclosed in D1 is chosen for optimally cracking walnuts. Shorter connecting elements are necessary for optimally cracking smaller nuts, such as hazelnuts. A problem with the nutcracker of D1 is therefore that it is not suitable for optimally cracking nuts of different sizes (or different types of nuts), such as walnuts and hazelnuts.

For the example solution independent claim, a definition of a problem with respect to D2 can be as follows: With the nutcracker of D2, a nut is cracked by blocks 1 and 2 when they are pushed one against each other. Skill is therefore needed to crack a nut without crushing it completely.

4.3. A total of **6 marks** are available for a **discussion of a solution** to the problem provided by the invention. To receive all the marks available, the solution has to be consistent with the independent claim of the answer paper.

Other arguments pertaining to problems that are not solved by the independent claim of an answer paper are not awarded marks.

4.3.1 For the example solution independent claim, a discussion of a solution with respect to D1 can be as follows: In the nutcracker of D1, a relative movement of the two support elements (lever arms) restricts a space between both support elements and the three connecting elements in which a nut to be cracked is placed. In the nutcracker according to the invention, not only a relative

movement of the two support elements can restrict the space, but also a relative movement of at least two connecting elements restricts the space. Therefore, moving the two support elements relative to each other causes the space to be restricted in (possibly) more directions than in D1. In other words, the space can be restricted in more dimensions than in D1. This allows different types of nuts of different sizes, such as walnuts and hazelnuts, to be squeezed and cracked.

For the example solution independent claim, a discussion of a solution with respect to D2 can be as follows: In the nutcracker according to the invention, the movement of one of the connecting elements relative to another connecting element caused by the relative movement of the support elements provides a lever effect allowing to crack a nut received between the support elements and the connecting elements in a controlled way.

5. Annex - Example set of claims

1. Nutcracker comprising
two support elements (1, 2),
at least three connecting elements (3-5; 3-6),
each connecting element being attached to each of the support elements,
the support elements and the connecting elements defining a space for receiving a nut,
characterised in that each connecting element is moveable with respect to each support element such that a movement of one of the support elements relative to the other support element causes at least one of the connecting elements to move relative to another of the connecting elements so that the space is restricted in order to crack a nut received in the space.

2. Nutcracker according to claim 1 for cracking walnuts and hazelnuts.

3. Nutcracker according to any of the preceding claims, wherein the support elements are plates (1, 2) or cubes.

4. Nutcracker according to any of the preceding claims, wherein at least one of the support elements has a through-hole to insert the nut into the space.

5. Nutcracker according to any of the preceding claims, wherein at least one of the support elements has a handle (11, 12) to form a lever arm.

6. Nutcracker according to any of the preceding claims, wherein the connecting elements are rods (3-5; 3-6) or tubes.

7. Nutcracker according to any of the preceding claims, wherein the connecting elements have the same length.

8. Nutcracker according to any of the preceding claims, wherein the connecting elements are four or five in number.

9. Nutcracker according to any of the preceding claims, wherein the connecting elements are provided with ridges, protrusions or non-slip paint.

10. Nutcracker according to any of the preceding claims, wherein at least one of the connecting elements is attached to a support element at one of its ends.

11. Nutcracker according to any of the preceding claims, wherein the connecting elements are attached to one of the support elements by attachment means (13-15, 23-25; 13-16, 23-26) equally spaced from the centre of the support element.

12. Nutcracker according to any of the preceding claims, wherein the connecting elements are attached to the support elements by means of ball-joints (13-15, 23-25).

13. Nutcracker according to claim 12, whereby a relative movement of the support elements causes a movement of each of the connecting elements relative to all the other connecting elements.

14. Nutcracker according to any of claims 1 to 11, wherein the connecting elements are attached to the support elements by means of hinges (13-16, 23-26).

15. Nutcracker according to claim 14, whereby a relative movement of the support elements causes a movement of each of the connecting elements relative to only one or only some of the other connecting elements.

EXAMINATION COMMITTEE I

Candidate No. _____

Paper A (Electricity/Mechanics) 2014 - Marking Sheet

Category	Maximum possible	Marks awarded	
Independent claim	50		
Dependent claims	35		
Description	15		
Total	100		

Examination Committee I agrees on ..... marks and recommends the following grade to the Examination Board:

☐ PASS (50-100)

☐ COMPENSABLE FAIL (45-49)

☐ FAIL (0-44)

24 June 2014

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Chairman of Examination Committee I