
Examiners' report on Paper A (Electricity/Mechanics)

1. General considerations

In his letter, the client describes a lock for preventing the actuator of a disk drive from moving when it is submitted to shocks, for which he has already obtained a patent (Figs.1 and 2 of the client's letter). This lock works well as long as the disk drive is submitted to linear shocks but can fail when the disk drive is submitted to rotational shocks.

The client also cites the document D1 disclosing a lock which can prevent the actuator from rotating when it is submitted to certain rotary shocks. The lock disclosed in D1 has a certain number of drawbacks. It does not lock the actuator instantaneously on occurrence of rotary shocks, since the inertia member 6 has to rotate first in order to engage the actuator 1. It does not work properly in case of small rotary shocks, since the inertia member 6 has to overcome the force exerted by the spring 10. Besides, it only works for rotary shocks in one direction. Also, it needs separate means for protection against linear shocks, as suggested in the last sentence of D1.

Most of the candidates directed their answer to a solution described below as the "balancing" solution. Some other candidates directed their answer to a solution described below as the "combi" solution.

2. Independent claim(s)

2.1 The "balancing" solution:

This solution required a feature relating to the counterbalancing effect, preferably based on the wording of page 3, last paragraph, 3rd sentence without "via the meshing gear teeth". It should have been clear from the wording of the claim that the member to be locked and the counter inertia member are rotatably coupled.

An independent claim that could attract full marks could be directed to a locking device for a disk drive and could include the following features, namely a rotatable locking member (21) and a rotatable counter inertia member (17), whereby the claim further makes it clear that the rotatable counter inertia member (17) is rotatably coupled with the rotatable locking member (21) and is configured such that the effect of the inertia of the counter inertia member balances the effect of the inertia of the rotatable locking member (21).

Other formulations were possible. For example, a claim referring to "a device for preventing a rotatable member (21) from rotating..." and thus not limited to a

locking device was also considered acceptable, provided it did not give rise to other negative observations. Also, a claim which recites the rotatable locking member and the rotatable counter inertia member in a sufficiently clear manner, such that the coupling between the two is implicitly rotational, did not require explicit recitation of this.

2.2 The "combi" solution

D1 discloses an inertia lock 6 against rotational shocks, which acts directly on an actuator 1. This differs from the client's arrangement where the means for protection against rotational shocks acts on a lock 21 that protects against linear shocks which in turn acts on an actuator. Accordingly, a claim that does not specify the counter balancing of the effect of inertia but does define this relationship could, if well drafted, provide a solution which is novel and involves an inventive step.

2.3 Additional independent claims

A single independent claim was considered sufficient for adequate protection of the invention. A method claim was not expected and was not rewarded because it does not add anything that might be useful for the enforcement of the patent.

2.4 Novelty

Lack of novelty has always been considered a serious deficiency and can cause the loss of more than half of the marks available for the independent claims.

2.5 Unnecessary limitations

The attention of the candidates is drawn to the fact that a substantial amount of points can be lost by unduly restricting the independent claims.

In an independent claim directed to the "balancing" solution, the restriction to a lock which is also effective against linear shock was considered a major restriction. Further specifications of the pivotable lock, such as the mention of the elongate portion for catching a flow of air, of the abutment 13a for contacting the actuator, or of biasing means for the lock were not penalised as heavily but could amount to a significant loss of points, if all these features were present. With regard to the rotational coupling, the mention of gears or wheels was also considered a major limitation. The limitation of the independent claim to a disk drive or a hard disk drive resulted in a relatively small deduction, but the restriction to a computer was more heavily penalised. Further small deductions were made for the mention of disk drive components such as the actuator, the head, the disk or the presence of a parking zone on the disk and its location.

2.6 Clarity

A claim which attempts to define the invention in terms of the underlying technical problem without defining the appropriate technical features is not acceptable (cf. Guidelines for Examination in the EPO C-III 4.7) and attracted a substantial loss of points.

Unclear wording was penalised according to the seriousness of the defect. The candidates should note that a lack of clarity can arise when referring to an entity which is not included within the scope of the claim (e.g. referring to a detail of the actuator in a claim directed to a locking device for an actuator in which the actuator itself is not explicitly claimed).

2.7 Formal matters

Formal deficiencies, such as a lack of two-part form (which was clearly appropriate in this case), a clearly incorrect two-part form or no reference signs resulted in a small deduction.

2.8 Separate applications

Although a separate application was not considered necessary, credit could be given for the clear indication of the subject-matter of a claim suitable for a separate application, by reference to selected portions of the claims (e.g. preamble of claim 1 and second portion of claim x) or a draft of the claim itself.

3. **Dependent claims**

Suitable subject-matter for the dependent claims includes the following aspects:

Details of the rotational coupling

- . gearing
 - .. segment 22 cooperating with wheel 17
 - .. ratio of the inertia of the counter inertia member 17 and the lock 21 is equal to the ratio of the radius of the gears of the counter inertia member 17 and the lock 21
 - .. segment formed integrally with lock 21
- . frictional coupling
- . tendency of the lock 21 and the (counter) inertia member 17 to rotate in opposite directions in response to rotational shocks.

Details of the lock

- .linear shock protection
- .. mass distribution of the locking means 21 balanced about its axis of rotation
- .. mass distribution of the counter inertia member 17 also balanced about its axis of rotation
- . release means for releasing the actuator from the park position
- .. airflow releasing the actuator; first portion 12 in the form of an elongate wing
- . abutment 13a contacting the actuator 5
- . biasing means for biasing the lock 11 in a position to block the actuator
- .. spring 15

Details of the disk drive such as the type of the support media, the rotation direction of the support media, or the position of the parking zone (at the centre or the periphery of the data support media).

Good candidates developed each of the major aspects identified above, namely details of the rotational coupling, details of the lock and details of the disk drive. These aspects should have been well defined, progressively developed and structured to provide good fallback positions.

4. Description

The relevant parts of the prior art of Figs. 1 and 2 of the client's letter (the previous patent of the applicant) and the prior art of document D1 should have been properly acknowledged and discussed.

Candidates were expected to disclose the invention in such terms that the technical problem and its solution can be understood. Normally, this requires an explanation of how the problem derives from the prior art. Marks were deducted when the statement of problem or the solution was not consistent with the independent claim(s).

General statements, such as "The problem is to improve the known apparatus" or "to avoid the disadvantages of the state of the art", received only few points, unless they were preceded by a detailed discussion of the disadvantages of the closest prior art

The instructions to the candidates require support only for the independent claim(s), thus all references to the dependent claims were ignored by the examiners. This year again, some candidates wrote a complete patent application with a complete description. No extra points were allocated to the core of the description and candidates who did so only lost time.

5. This year, half of the points available related to the dependent claims and the description. Many candidates lost points by not paying enough attention to the dependent claims and the description.

EXAMINATION COMMITTEE I

Candidate No.

Paper A (Electricity/Mechanics) 2002 - Schedule of marks

Category	Maximum possible	Marks awarded		Marking by further examiners if any	
		Marker	Marker	Marker	Marker
Independent claims	50				
Dependent claims	35				
Description	15				
Total	100				

Sub-Committee for Electricity/Mechanics agrees onmarks and recommends the following grade to the Examination Board:

☐ **PASS**
(50-100)

☐ **FAIL**
(0-49)
COMPENSABLE FAIL
(45-49, in case the candidate sits the examination for the first time)

Southampton, 30 August 2002

I. Harris – Chairman of Examination Committee I