

Examiners' Report on Paper A/1993 (Electricity/Mechanics)

1. In the past, the examiners' reports on this paper were largely devoted to comments on the responses of the candidates, for the information of the tutors who had prepared those candidates for the examination.
2. The present report takes a somewhat different form, since it is addressed to future intending candidates who may wish to use the papers set in 1993 as practice exercises in their preparation for a later examination. It will of course also be of interest to tutors, who will be able to use it as a guideline for marking such exercises.
3. Three aspects are considered, namely the content of the independent claim or claims (to which about 50% the available marks are given), the content of the dependent claims (to which about 30% of the total marks are given) and the drafting of an introduction to the description which should provide adequate support for the independent claims.
4. The client's letter indicates that protection should be sought for a microwave oven of the type having a rotational antenna, the essential features are considered to be: (a) a cavity for receiving the goods to be heated, (b) a source of microwave radiation and (c) some arrangement for ensuring that the generated radiation is fed to the antenna. It is evident that the antenna must be located within the cavity. The generator would, according to the client's letter, preferably be located outside the cavity and connected to the antenna via a waveguide. However, candidates are instructed to seek the broadest possible protection and the main claim should therefore rehearse only those features which are technically necessary: the proper place for preferred implementations of this kind is in the dependent claims.
5. It follows that the preamble of the main claim should be along the lines presented in Claim 1 of Paper B. It would however be possible to draft the preamble somewhat more broadly, especially as regards the requirement for a rotational antenna. It is of course consistent with the client's instructions to restrict the main claim to the rotational antenna type of oven. The client has however drawn attention to the existence of an alternative type of oven in which the antenna is fixed and the goods to be heated are rotated.

Thus candidates may justifiably conclude that the essential requirement is provision for relative movement of the antenna and goods to be heated and hence decide not to restrict the main claim to the case in which the antenna is itself rotatable. The examiners consider this approach allowable, however, candidates who restricted their main claim to the rotatable antenna case were not penalised in marking. On the other hand, those candidates whose main claim was not so restricted were expected to draft the introduction to the description in such a manner as to provide support for the broader main claim.

6. The subject-matter set forth in the preamble of the main claim being known from Document I, it is necessary to present a characterising feature or features not known from that source. The client's letter clearly indicates that the significant distinction from Document I is the means for ensuring increased efficiency of operation by avoiding the energy losses inherent in repeated reflections of microwaves by the cavity walls. Clearly the concave (so-called "dome-shaped") reflector is the essential component for this purpose and mention of it is sufficient to confer novelty over Document I.

However, mere mention of the fact that the reflector is dome shaped or concave, without indicating its purpose or effect, does not give adequate expression to the essential functional distinction which is not merely to reflect the microwaves but rather to ensure that they go as directly as possible to where they are needed. The main claim presented in Paper B designedly expressed this function in a rather vague way, since for the purpose of that paper it was desired to present a main claim which was unquestionably anticipated by Document III, thus that claim is not to be seen as an ideal solution to the Paper A task.

A clearer formulation of the essential functional aspect could have resulted from specifying in the preamble that there is a heating or cooking zone at a predetermined location within the cavity and in the characterising part requiring that the reflector be arranged to direct microwaves to that zone, thereby avoiding repeated reflections from the cavity walls. It is however important to express the functional requirement sufficiently precisely to differentiate from the reflection which is in any case provided by the internal side wall surfaces of such a cavity, since failure to make this distinction would make the main claim open to an objection of lack of novelty with respect to Document I.

It should however be noted that a definition in purely functional terms omitting the mention of a concave reflector has resulted in a loss of marks since such claims were considered either not to sufficiently define the invention as required by Art. 84 EPC or - in extreme cases (see the last paragraph above) - even as lacking novelty with respect to Document I.

7. Candidates who place undue restrictions on the client's protection are penalised in marking. It is a mistake to set out in the main claim (in particular in its preamble respectively) every feature, however trivial, which the inventor's structure has in common with the nearest prior art. It is sufficient, and in the client's best interest, to specify only the essential components (i.e. items (a), (b) and (c) in paragraph 4. and the reflector mentioned in paragraph 6. above).
8. Examples of features which the examiners considered unduly restrictive in the main claim are:
 - a) the use of a waveguide to connect the generator to the antenna;
 - b) requiring the reflector to be part of the cavity wall itself;
 - c) restricting the reflector to the described cone-truncated form;
 - d) specifying the rectangular shape of the cavity or its walls;
 - e) specifying that the antenna and/or the reflector is/are located at the top of the cavity.

Examples of less serious, but still unnecessary restrictions are:

- f) requiring the generator to be located outside the cavity;
- g) requiring that the generator has to be a magnetron;
- h) specifying that the oven has a door.

9. A candidate whose main claim was in terms of the features mentioned in paragraphs 4. and 6. above, without the inessential features mentioned in paragraph 8., would be awarded most of the marks available for the independent claim(s). A few further marks could be gained by proposing independent protection of certain other aspects, provided that - as the instructions to candidates required - the subject-matter to be independently protected was clearly identified. However, candidates who made such proposals were expected to deal with the question of unity of invention.
10. The aspects which could be claimed independently of a main claim to the reflector and its function comprised:
 - (a) the use of the waveguide as an air conduit;
 - (b) the multiple use of the air flow, i.e. to rotate the antenna as well as to cool the equipment and to expel vapours from the cavity; and
 - (c) the way in which the waveguide is constructed, using a single component to provide three of its faces and the external surface of the cavity as the remaining face.
11. Candidates who directed their main claim to (a), (b) or (c) in paragraph 10. and failed to propose independent protection for the essential subject as discussed in paragraph 6. were heavily penalised for failing to observe the express wishes of the client.
12. Method or use claims were not expected and were generally considered to be inappropriate, with one exception: the examiners considered it valid to claim the aspect mentioned in item (c) of paragraph 10. as a method of manufacturing a microwave oven. It was however neither necessary nor preferred to claim it in this way.
13. Before discussing the requirements for dependent claims, the examiners draw attention to the Instructions to Candidates which state that these claims should be "so drafted to enable you to fall back upon them ...". It is admitted that the dependent claims presented in paper B are by no means ideal from this point of view. As with the main claim, the dependent claims of Paper B were so drafted as to be attackable in the EPO Communication and are not to be regarded as a model for what was required in the response to the Paper A task.
14. The examiners gave highest marks to those candidates who directed the dependent claims in Paper A to:
 - (a) the aspects set out under (a), (b) and (c) in paragraph 10. (NB: even if they were also to be claimed independently in (a) separate application(s), it is still appropriate to ensure that they are protected in combination with the invention of Claim 1);
 - (b) the cone-truncated form of the reflector;
 - (c) the given range of values for the angle α (which is the inclination angle of the cone-truncated part of the reflector);
 - (d) the fact that the reflector is part of the cavity wall itself;
 - (e) the form and function of the transition section of the waveguide

(in particular with respect to the air flow in it).

Of course, candidates who had already included any of these subsidiary features in their main claim, could not be expected to incorporate them in the dependent claims as well. The mistake of placing a preferred but inessential feature in the main claim is already penalised in the marking of the independent claim(s) and the candidate is not penalised again for failing to put it in the dependent claims.

15. As to the description, merely reproducing most or all of the information presented in the client's letter, without any adaptation to the claimed solution, was not considered sufficient. Adaptation was needed in order to:

(a) acknowledge the given prior art in an appropriate way (i.e. as a prior publication of a device having all the features defined in the preamble of Claim 1);

(b) provide an explicit or implicit statement of the problem solved by the subject-matter claimed; and

(c) make the description fully consistent with the wording of the main claim, thereby providing clear support for the invention as claimed and not some other potential invention.

16. In the foregoing, the main requirements for a good solution as regards the independent and dependent claims as well as the supporting description have been set out in relation to the particular task which was set. The essential distinction expected to be presented in Claim 1 was one which the examiners felt could best be presented in functional terms, since in the present case restricting the reflector of Claim 1 e.g. to a cone-truncated form has the effect of excluding from protection other, equivalent forms which would have the same desired effect.
 17. Some general remarks on the drafting of claims including functional limitations appear desirable in conclusion. It is of course true that an apparatus or device claim which does not identify any concrete components and refers only to a vaguely specified function is open to the objection of lack of clarity, e.g. on the grounds that it merely presents a problem and does not define the solution. When, however, the essential components have been sufficiently identified and the invention is conceived to reside in providing some further means to ensure that a required additional function is performed, then it is not inappropriate (and EPO practice certainly permits) to present those means in functional terms.
 18. The criteria for an acceptably formulated "means for plus function" feature are (a) that the function itself is clearly identified and (b) that the skilled man, knowing the function, would have no difficulty in providing some means of performing this function without exercising inventive skill (cf. also the "Guidelines for Examination in the European Patent Office", part C, chapter III, 2.1).
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EXAMINATION COMMITTEE I

Candidate's answer-paper No.

Report by examiner No.

FORM, for use by individual examiners, in PAPER A (Electricity/Mechanics)

Schedule of marks

Category	Maximum possible	Individual marks awarded	Where grades awarded are not identical	
			Revision of marks/grade (if any)	Remarks*
Claims: - Scope of protection = independent claim or claims	24			
	14			
Description: (Field and prior art, problem and/or discovery, solution and advantages)	10			
TOTAL	48			
CORRESPONDING GRADE				

Translation of marks into grades

	Grade
0 - 11	7
12 - 17	6
18 - 23	5
24 - 29	4
30 - 35	3
36 - 41	2
42 - 48	1

* to be filled in if both the following requirements are fulfilled:

- (a) the grades awarded by the two individual examiners before their discussion differ by two grades or more;
 - (b) the marks awarded by at least one of the two individual examiners have been changed during their discussion.
- If remarks are to be filled in, they should briefly explain **why** the examiner has changed his marks.