Examiners' Report on Paper A

Background

The candidate is informed by the client that the invention relates to a cursor control device in the form of a trackball or mouse which is an improvement of a known device described in Document DI. The known device relies on potentiometers to detect the position of the device. In particular, the client says (see page 2, third paragraph) that he feels that the features of the new device which avoid the problems of limited reach suffered by the prior art device ought to be protected. Both embodiments of the new device overcome this problem, one using an optical transducer and the other using an inductive transducer. What the two embodiments have in common is that the transducers produce pulsed signals which, in principle, can continue to be produced without ever reaching an end stop. Although the client also writes at page 7, first paragraph, that potentiometers have other disadvantages owing to wear and inherent inaccuracy, the candidate is expected to concentrate on the aspect which he is told his client is interested in, and to make this the subject of the independent claim.

1. Independent claim(s)

1.1 A good independent claim must thus be directed to the concept of pulsed signals. An example of such a main claim is one directed to a cursor control device comprising a rotatable ball and at least one transducer associated with the ball, including a good functional definition of the or each transducer having means for translating rotation of the ball into a pulsed signal. A good functional definition is one which clearly defines the function and which does not make it necessary for the skilled reader to invent in order to make a device capable of carrying out the specified function.

1.2 Additional independent claims directed to a method of using the device were felt to be generally unnecessary.

1.3 Claim 1 of Paper B is felt to represent a reasonable solution for the independent claim of Paper A, although the reference to a second transducer is unnecessary, since a conceivably useful device could merely detect motion of the ball in one direction. In addition, it may be regarded as unnecessary to refer to the ball being "freely" rotatable. The highest marks were thus given to candidates who drafted their claims in somewhat broader terms than claim 1 of Paper B.

1.4 Although it may also be thought that the claim could omit any reference to the ball and thus attempt to claim the transducer per se, such a claim will inevitably include a reference to an encoder. This was felt to be a more undesirable restriction than a reference to the ball and so was not regarded with favour.

1.5 A claim which does not refer to pulses, even implicitly, but merely refers to means for generating or producing signals may well not be new, since a potentiometer also does this. This is clear from the document DI, which states at page 2, lines 23 to 27 that "The voltages at the output terminals ... vary between +V and ground potential, and are thus dependent on the actual positions of the wipers (36,37). These voltages thus depend ... on the position of the indicator device (1) on the support surface". The known device thus provides an electrical output which is variable in dependence on the position of the rotatable ball, thus, in effect, providing a signal representative of the position of the ball.

1.6 It was also the opinion of the examiners that the reference in the claim to the projecting out of the housing in claim 1 of Paper B could be omitted in the answer to Paper A without any effect on the marking. Although a number of candidates attempted to provide a broader term than "ball", such attempts did not, in our opinion, achieve any useful increase in breadth of protection.

1.7 Some candidates claims were regarded as a mere statement of the problem to be solved or a wish. Examples of this include claims which specify that the transducers are rotatable through a desired or unlimited angle. Such claims were in general not favourably regarded. On the other hand, such claims must be assessed in relation to the stated problem. Thus, if the problem is stated as being to improve the movement of the cursor or the mouse, or to eliminate wear and tear between the ball and the transducers which would occur when the potentiometers reach their end positions, it may be possible to regard making a rotatable member of the transducer endlessly rotatable as being a solution to the problem.

1.8 Some forms of claim drafted by candidates were either not new or only achieved novelty by excluding the presence of potentiometers. Examples of claims lacking novelty include claims intended to be characterised by a statement that the signals are indicative of movement, or a reference to a transducer in the misapprehension that the term "transducer" excludes a potentiometer. In such a case, the examiners looked at the description to determine what the candidate actually intended by his claim wording, and marked accordingly.

1.9 A claim directed to a computer system is very limited, and was penalised accordingly. This did not, of course, apply to claims directed to a cursor control device "for use with" a computer system.

1.10 A number of unnecessary limitations were included in the independent claim and resulted in loss of marks. These included the presence of two transducers, sometimes the claim being further limited by a restriction to the transducers being at right angles to one another; the transducers including encoder discs, sometimes said to have slots and with or without signal emitting and detecting means, thus sometimes excluding the second embodiment; each transducer produces two staggered signals; means, such as a roller for biasing the ball; the transducers operate in a contactless manner; and a reference to a button or switch. Less significant unnecessary features included specifying that the housing has upper and lower parts and the transducers have shafts or rollers. Although these latter features are unnecessary, it was felt that they would be difficult to avoid when carrying out the invention in practice.

1.11 The following features, when included in addition to those of claim 1 of Paper B, were not felt to introduce any unnecessary limitations: the transducers being rotational; means for producing directional information; "endless" transducers (i.e. transducers without end stops); and "electrical" signals.

1.12 Some candidates produced claims which specified the presence of not only encoder discs, but also optical emitting and detecting means, thus excluding the second embodiment. Such claims are obviously not satisfactory. On the other hand, a claim which specifies emitting and detecting means in general was given the benefit of the doubt and regarded as

including the second embodiment, in which the permanent magnet can be regarded as emitting means.

1.13 None of the alternatives found by candidates to a main claim directed to the concept of a transducer which produces a pulsed signal was felt to be satisfactory. Thus, a claim directed to the "contactless" feature is contrary to the client's instructions at page 2, third paragraph, where it is stated that "we feel that the features of the device which avoid the problems of limited reach in the device of Document I ought to be protected". Merely making the transducer function in a contactless manner does not necessarily solve the problem of limited reach, although some candidates assumed that this was the case. Further, whilst it is true that the cited art does not suggest a contactless transducer, the client also does not suggest that he has invented a contactless transducer. It was, moreover, a frequent fault in claims directed to this aspect that it is not clearly specified in the claim what is not in contact with what. Such a claim was regarded by the examiners as being worse than a claim including this feature as an unnecessary limitation, since as the sole characterising feature it must be regarded as essential and cannot therefore be deleted during prosecution. A claim specifying that the transducers are either optical or inductive was treated similarly.

1.14 A claim directed to the arrangement whereby the ball is biassed into contact with the transducers is also contrary to the client's instructions and was regarded by the examiners as being worse than the "contactless" solution as being even more remote from solving the problem of limited reach.

1.15 Some candidates produced claims which specified that the transducers comprise encoder discs with slots or markings which result in the production of signals upon rotation of the disc. This is not regarded as being an alternative solution. It is, in effect, the preferred, pulsed signal solution with the inclusion of the unnecessary limitation of the structure used to produce the pulsed signals, and such claims were marked accordingly.

1.16 **Clarity**. Candidates attempting the preferred solution did not in general have too much difficulty avoiding writing claims which were seriously unclear. The main problem in this area was claims which listed components without specifying their interaction. On the other hand, as pointed out above, claims directed to the "contactless" solution often suffered from a major lack of clarity insofar as it was not specified what is not in contact with what. An example of a minor lack of clarity which occurred in a number of answers and lost marks accordingly, is a "hybrid" claim, that is, an apparatus claim characterised by method features.

1.17 **Lack of Unity.** Although a number of candidates presented a set of claims lacking unity, no penalty was made, and independent claims directed to, for example, a control circuit or roller "for use with" the cursor control device were simply ignored. This does not, however, mean that no penalty will be exacted for similar faults in future years. On the other hand, if two independent claims are present such as one directed to the optical embodiment and one directed to the inductive embodiment, these were regarded as equivalent to a single claim containing the two alternatives.

1.18 **Formal matters.** Claims without reference numerals or in incorrect two-part form or one-part form lost some marks.

2. Proposals for separate applications.

2.1 Proposals for useful separate applications which are clearly identified, for example by means of a reference to dependant claims of the main application, i.e. those which give useful additional protection and relate to a different inventive concept from the main application, could earn the candidate some credit. An example of such an application is one directed to the biassing arrangement.

2.2 On the other hand, candidates having the biassing arrangement in the main application and thus already subject to the loss of marks could recover some of those lost marks by proposing a separate application to the pulsed signal solution.

3. Dependent claims

3.1 In the event that they are not included in the main claim, the following are considered to be the most important aspects for which dependent claims should be present:-

1) two transducers, the axes being preferably mutually perpendicular;

2) each transducer producing two staggered signals.

At least one dependent claim should be present in each of the above categories which provides a broad definition and consequently a good fall back position by claiming the features separately.

3.2 Other, less important aspects, for which dependant claims should also be drafted are:-

1) the biassing means;

2) the encoder disc; and

3) "contactless" transducers, that is, optical and inductive transducers.

In the event that one of these features is already present in the independent claim, the examiners looked for claims directed to further development of these features in the dependent claims. A good set of dependant claims must represent a well-structured fall-back position.

4. Description

4.1 Candidates were expected to deal with formal matters, including, for example, redrafting the opening paragraph of the description for consistency with the invention as claimed.

4.2 More important was a proper acknowledgement and criticism of the disclosure of DI. This may involve importing the passage from page 7 of the client's letter. Although it is regarded as being satisfactory to merely state that DI discloses the features of the preamble of claim 1, good candidates produced a more critical acknowledgement.

4.3 The description should include an explicit or implicit statement of the problem and solution which is consistent with the independent claim(s). In the case of the preferred solution, this means a reference to the problem of limited reach.

4.4 The Instructions to Candidates requires support for the independent claim(s) only. Thus, all references to the dependent claims were ignored in the marking. Candidates who provided detailed support for all their dependant claims were thus wasting time which could have been better spent.

EXAMINATION COMMITTEE I

Candidate No. .....

Paper A (Electricity/Mechanics) Schedule of marks

Category	Maximum possible	Marks awarded		Revision of marks / grade (if any)	
		Exr	Exr	Exr	Exr .....
Independent claims	24				
Dependent claims	14				
Description	10				
Total	48				
Corresponding Grade					

Translation of marks into grades

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

Marking by further examiners if appropriate

	Independent claims	Dependent claims	Description	Total	Grade
Examiner					
Examiner					

Remarks (which must be given 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 marks are revised, a brief explanation should be given.

Sub-Committee for Electricity/Mechanics agrees on _____ marks and grade _____

Grade recommended to Board _____

The Hague, 5 September 1996

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J. Combeau - Chairman of Committee I