Europäisches Patentamt
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Office européen des brevets

Munich, 6 June 2025

MOCK paper M1

A MOCK paper M1 is now available for testing and preparation purposes (see annex 1).
For each question the achievable marks are indicated.

A model solution addressing the expected answers for all questions is included in annex 2 (only in English).

For the Examination Board
The Chairman

Jakob Kofoed

Mock paper M1

M1 - Part 1

Exam date: 1 March 2025

Company X develops and manufactures metallic hand planes in Denmark. X sells planes in Europe and the USA. Hand planes are used in traditional woodworking.

Figure of a metallic hand plane in use on wood.

D1 published on 1 January 1950 discloses the use of candle wax to coat a metallic hand plane to reduce friction when hand planing wood. Wax is applied at regular time intervals as it is rubbed away during use. The wax basically does not cost anything as old candle leftovers may be used. It was found that friction between the plane and the wood can be permanently reduced by applying a polymeric material coating to the metallic surface of the plane. Research has been intensively ongoing in this technology. Candle wax is not a polymeric material.

X filed a Danish application DK-X on 2 March 2023 disclosing and claiming metallic hand planes coated with polymeric material. A specific polymer, polyethylene (PE), was disclosed as an embodiment. D1 is mentioned in DK-X as prior art. DK-X was withdrawn before publication.

X filed a European application EP-X on 1 March 2024 in Danish claiming priority from DK-X at the EPO and all fees have been duly paid.
EP-X contains all matters of DK-X and also includes a further embodiment directed to the use of polyamide (PA) as a polymeric coating material. Claims 1-5 below were filed in Danish.

X filed a translation of EP-X into English on 15 March 2024 and also included a further freshly developed embodiment as claim 6 directed to polytetrafluorethylene (PTFE) as the polymeric coating material.
X also filed the same English specification on 15 March 2024 with all 6 claims at the USPTO without claiming priority.

The claims of EP-X as translated into the EPO official language English/French/German read:

1. A metallic hand plane, characterised in that it is coated with a polymeric material.
2. A metallic hand plane as claimed in claim 1, further characterised in that the polymeric material is polyethylene.
3. A metallic hand plane as claimed in claim 1, further characterised in that the polymeric material is polyamide.
4. A metallic hand plane, characterised in that is coated with a substance to reduce friction and thus human labour efforts when used on a relatively hard wood.
5. A method of planing wood using any of the metallic hand planes of claims 1-3
6. A metallic hand plane as claimed in claim 1, further characterised in that the polymeric material is polytetrafluoroethylene.

EP-X was published on1 September 2024. The European search report contains the following documents:

1. D1 mentioned above.
2. D2 is a European patent application filed on 1 February 2022 and published on 1 August 2023. D2 discloses only a metallic hand plane coated with polyvinylchloride (PVC) said to inhibit corrosion. PVC is a specific polymeric material. Mr Artisan is applicant for D2. D2 as filed includes one claim reading: “A metallic hand plane characterised in that is coated with PVC.”
3. D3 published on 1 June 2023 is a woodworking magazine article. It is suggested to coat metallic hand planes with polymeric materials to reduce friction. It does mention both PE and PA as possible polymeric materials.
4. D4 published in 1970 mentions that polymeric materials may be used as a coating on large container ships to reduce friction when the ship is propelled through water. PE is mentioned as a possible polymeric material. Container ships are made of metallic material such as steel.

Q1 (2 points)
Which of claims 1-3 in EP-X are not in conformity with Article 84 EPC?
Select from list.

Q2 (3 points)
What is the category of claim 5?
Entity / Activity.

Is claim 5 an independent claim?
Yes / No.

Q3 (2 points)
Is claim 4 in conformity with Article 84 EPC?
Select one or several from list.

- No, due to obscure category
- No, due to unclear terms
- No, due to formulation as result wished to be achieved
- No, due to missing essential features

Q4 (3 points)
Claim 1 lacks novelty under Articles 52 and 54 EPC over:
D1? D2? D3? D4?

Q5 (3 points)
Claim 2 lacks novelty under Articles 52 and 54 EPC over:
D1? D2? D3? D4?

Q6 (3 points)
Claim 3 lacks novelty under Article 52 and 54 EPC over:
D1? D2? D3? D4?

Q7 (5 points)
What is the effective date of filing under the EPC for the subject-matter of claim 2?
Select one from list.

- 2 March 2023.
- 1 March 2024
- 15 March 2024
- Claim 2 has none

What is the effective date of filing under the EPC for the subject-matter of claim 6?
Select one from list.

- 2 March 2023.
- 1 March 2024
- 15 March 2024
- Claim 6 has none

Q8 (4 points)
Assuming D1 is the closest prior art, the objective technical problem of claim 1 may correctly be formulated as:_____
Drag / Drop

- Reducing friction between a metallic hand plane and the wooden workpiece
- Saving costs
- Reducing fire hazards from candle lights
- Providing a permanent reduction in friction between a metallic hand plane and the wooden workpiece

Q9 (3 points)
Assuming D1 is the closest prior art, which documents can formally be used with D1 to argue the lack of inventive step of the subject-matter of claim 2, irrespective of the chance of actually proving obviousness.
Select from list.
D2? D3? D4?

Q10 (5 points)
It has now been established by comparative tests and market results that PTFE very surprisingly is highly superior to all other polymeric coatings. Only hand planes with a PTFE coating have market potential.
Which of the following options would enable X to obtain valid patent protection in Europe for metallic hand planes with PTFE coating?
Select one or more from list:

- Maintain claim 6 of EP-X and delete all other claims
- File a PCT application having a claim to a hand plane coated with PTFE claiming priority from EP-X
- File an EP application having a claim to a hand plane coated with PTFE claiming priority from US-X

Q11 (5 points)
It has today been established by comparative tests and market results that, very surprisingly, PTFE is highly superior to all other polymeric coatings. Only hand planes with a PTFE coating have market potential.
Which of the following options would enable X to obtain valid patent protection in Europe for metallic hand planes with a PTFE coating?
Select one or more from the list below:

- File a European divisional application based on claim 6 of EP-X
- Validate EP-X under the UPC if granted
- File an amended claim 1 for EP-X, including a disclaimer for a metallic hand plane with a PVC coating

Q12 (1 points)
The application does not meet requirement of Article 82 EPC due to a lack of unity between the subject-matter of claims 1 and 5.
Yes/No

Q13 (5 points)
You see today in EPO online file inspection for D2 that amended claims were filed by Mr Artisan during substantive examination.
Amended claim 1 of D2 now reads,
A metallic hand plane characterised in that it is coated with a polymeric material.

If D2 is granted by the examining division with the amended claim 1, the resulting patent will:

_____
Drag and drop from list.

- Constitute novelty, destroying prior art against all claims of EP-X
- Give Mr Artisan the right to market his metallic planes coated with any polymeric material in Europe
- Constitute a danger of infringement for the business of X when manufacturing or selling metallic planes with a PTFE coating in Europe

Q14 (5 points)
You see today in EPO online file inspection for D2 that amended claims were filed by Mr Artisan during substantive examination.
Amended claim 1 of D2 now reads:
A metallic hand plane characterised in that it is coated with a polymeric material.
Company X is now very worried about D2. What can X do to successfully deal with the situation of D2?
Select one or more correct suggestions from the list below:

- File observations as a third party under Article 115 EPC today and argue the lack of novelty of the amended claim 1 in D2 in view of EP-X
- Await any grant of D2 and file an opposition under Article 100(c) arguing that claim 1 is not in conformity with Article 123(2) EPC
- Request oral proceedings now before the examining division in charge of D2

Q15 (1 points)
Claim 5 relates to an act performed by a human being and is excluded from patentability by Article 53(c) EPC.
Yes/No

M1 - Part 2

Application as originally filed on 1 January 2025. No priority claimed.

Description

The present invention is directed to golfclub shafts.

A golfclub is used by the professional or recreational golfer to precisely hit a golf ball towards a target. Traditional golfclubs comprise a grip to be held by the golfer with their hands, a head to make contact with the golf ball and transfer energy to propel the ball forward and a shaft connecting the grip and head of the golfclub.

For centuries, golfclub shafts were made of wood. Technological progress in the past century has enabled the manufacturing of lightweight tubular steel shafts. A golf shaft varies in length between around 0.75 and 1.25 metres depending on the type of golfclub.

Today, tubular golfclub shafts are often made by forming a matrix of fibre-reinforced polymers. Polyester or epoxy polymers are mainly used, with carbon or glass fibres used as reinforcement.

The figure shows a golfclub according to the state of the art.

It is a known problem that if the ball is not hit well in the centre of the golfclub head, strong vibrations may occur in the shaft and thus in the grip. Such vibrations are unpleasant - especially in cold weather - and may lead to hand or elbow injuries on the part of the golfer.

As a solution to the problem, it has now been found that vibrations may be significantly reduced by the incorporation of hollow glass microspheres into the matrix of the shaft.

Hollow glass microspheres are widely known as such and may be used as fillers in concrete, for example, to reduce weight and density. Hollow glass microspheres are usually between 1 and 1 000 micrometres in diameter.
Surprisingly good results have been achieved with the following combinations of polymers, fibres and hollow glass microspheres. In fact, following extensive tests, the reduction in vibrations is only achieved in the following specific combinations.

Polymer	Fibres	Glass microspheres size (micrometres)
EPOXY	Glass	20-80
EPOXY	Carbon	20-80
Polyester	Glass	200-400
Polyester	Carbon	200-400

Beyond golf, many other recreational and industrial applications require the use of tubular shafts of very different sizes. For example, tubular shafts are needed for fishing rods, umbrellas, tennis rackets and vaults for pole vault competitions. The shafts of the present invention may obviously also be employed in other such applications to dampen undesired vibrations.

Claims

1. A tubular golfclub shaft made of a matrix of polymeric material and reinforcement fibres, characterised in that hollow glass microspheres are incorporated into the matrix.

2. A tubular golfclub shaft according to claim 1 further characterised in that the reinforcement fibres are made of glass or carbon.

3. A tubular golfclub shaft according to claim 1 or 2 further characterised in that the polymeric material is polyester or epoxy.

4. A tubular golfclub shaft according to any previous claim, further characterised in that the hollow glass microspheres are between 1 and 1 000 micrometres in diameter.

Communication EESR from the EPO

1. The examination is based on the application as originally filed.

2. Documents D1 and D2 are prior art in accordance with Article 54(2) EPC.

3. The subject-matter of claims 1 to 4 is not novel within the meaning of Articles 54(1) and (2) EPC because it is known from D1.

   D1 discloses a tubular golfclub shaft made of a matrix of polymeric material and reinforcement fibres, characterised in that hollow glass microspheres are incorporated in the matrix. See paragraphs 1-2 and 4 of D1.
   Further, D1 discloses a tubular golfclub shaft characterised in that the reinforcement fibres are made of glass or carbon. See paragraph 2 of D1.
   Further, D1 discloses a tubular golfclub shaft characterised in that the polymeric material is polyester or epoxy. See paragraph 2 of D1.

   Still further, D1 discloses a tubular golfclub shaft characterised in that the glass microspheres are between 1 and 1 000 micrometres in diameter. See the last paragraph in D1.

   It is noted that D2 discloses hollow microspheres of either 50 or 300 micrometres in size.

4. To maintain the application, new claims should be filed which take the above objections into account. Care should be taken to ensure that the new claims comply with the requirements of the EPC in respect of clarity, novelty, and inventive step (Articles 84, 54 and 56 EPC).

5. Any amendments should not introduce subject matter which extends beyond the content of the application as originally filed (Article 123(2) EPC).

Prior art D1

European sports magazine published 1 July 2024

1. *Many popular sports and leisure activities require the use of specialised tools and equipment. For example, special rackets are needed for tennis and badminton, fishing rods are used when fishing, golfclubs are used when playing golf. Strong, lightweight and flexible tubular shafts are needed in all such applications.*
2. *Modern tubular shafts can be made by using a matrix of fibre reinforced polymers. Either polyester or epoxy polymers can advantageously be used. Carbon or glass fibres can be used as reinforcement for both types of polymers.*
3. *Strong vibrations may occur in such shafts and such vibrations are not desired.*
4. *It has now been found that vibrations may be significantly reduced through the incorporation of hollow glass microspheres into the matrix of the shaft.*
5. *Glass microspheres are usually readily available in sizes ranging between 1 and 1 000 micrometres in diameter.*

Prior art D2.

European building and concrete specialist magazine published on 1 July 2024

Concrete has been used for the construction of buildings and other larger structures over centuries.

Concrete is fairly dense and it is a known problem that larger concrete structures (e.g. bridges or skyscrapers) may be very heavy, leading to the risk of their collapse.

It has now been found that hollow glass microspheres of either 50 or 300 micrometres in size can optimally be employed as fillers in concrete to reduce its density and thus the total weight of concrete structures.

Client letter

Dear Mr Björn Niclaus,

We have reviewed the EPO communication and provide you in the following with what is hopefully a helpful basis for proceeding further.

We note the claims 1-4 as filed are argued to fully lack novelty over D1. We also take note of D2.

Obviously, we still have an interest in protecting our golfclub shaft technology.
Please prepare new claims - as necessary - to still protect our technology and invention as far as possible.

Additionally, we have recently initiated a further new large-scale business in Europe for very long (10 metres or more) tubular flag poles with the very beneficial reduction of vibrations in strong wind. Sales have already started and are ongoing. We employ tubular epoxy shafts with carbon fibre reinforcements. For optimal vibration dampening, we have found glass microspheres measuring exactly 50 micrometres to be the optimal size. We certainly need patent claims to cover the tubular shafts for our very long flag poles if possible.

Please provide me with a written response today featuring the following:

1. A new set of claims as indicated above fulfilling the requirements of the EPC. **(20 points)**

2. Clear argumentation in respect of novelty and inventive step of the claimed subject-matter over D1 and D2 following the standards set out in the Guidelines for Examination in the European Patent Office parts G VI & VII. **(15 points)**

3. Arguments in support of conformity with Article 123(2) EPC for the new set of claims. The basis in the application as originally filed for the amendments should be clearly and fully indicated (Article 123(2) EPC and Rule 137(4) EPC) following the standards set out in the Guidelines for Examination in the European Patent Office part H. **(10 points)**

4. Please also explain how the new, amended claims cover our tubular shafts for very long flag poles. **(5 points)**

We do <u>not</u> wish to amend the description at this time.

Kind regards,

Lionel Woods

Q1 (2 points)
Which of claims 1-3 in EP-X are not in conformity with article 84 EPC?
Select from list.
(**None**)

Q2 (3 points)
What is the category of claim 5?
Entity / Activity.

Is claim 5 an independent claim?
Yes / No.

Q3 (2 points)
Is claim 4 in conformity with art 84 EPC?
Select one or several from list.

No due to obscure category.
No due to unclear terms
No due to formulation as result wished to be achieved.
No due to missing essential features.

Q4 (3 points)
Claim 1 lacks novelty under art. 52 & 54 EPC over:
D1? D2? D3? D4?

Q5 (3 points)
Claim 2 lacks novelty under art. 52 & 54 EPC over:
D1? D2? D3? D4?

Q6 (3 points)
Claim 3 lacks novelty under art. 52 & 54 EPC over:
D1? D2? D3? D4?

Q7 (5 points)
What is the effective date of filing under the EPC for the subject-matter of claim 2?
Select one from list.

2.3.23.
1.3.24
15.3.24
Claim 2 has none

What is the effective date of filing under the EPC for the subject-matter of claim 6?
Select one from list.

2.3.23.
1.3.24

15.3.24
Claim 6 has none

Q8 (4 points)
Assuming D1 is the closest prior art, the objective technical problem of claim 1 may correctly be formulated as:
Drag / drop

- Reducing friction between a metallic hand plane and the wooden workpiece.
- Saving cost.
- Reducing fire hazards from candle lights.
- Providing permanent reduction of friction between a metallic hand plane and the wooden workpiece.

Q9 (3 points)
Assuming D1 is the closest prior art, which documents can formally be used with D1 to argue lack of inventive step of the subject-matter of claim 2 irrespective of chance of actually proving obviousness.
Select from list.
D2? D3? D4?

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Which of the following options would enable X to obtain valid patent protection in Europe for metallic hand planes with PTFE coating ?
Select one or more from list.

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- File a PCT application having a claim to a hand plane coated with PTFE claiming priority from EP-X.
- File an EP application having a claim to a hand plane coated with PTFE claiming priority from US-X.

Q11 (5 points)
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Which of the following options would enable X to obtain valid patent protection in Europe for metallic hand planes with PTFE coating?
Select one or more from list.

- File a European divisional application based on claim 6 of EP-X.
- Validate EP-X under the UPC if granted.
- File an amended claim 1 for EP-X including a disclaimer for a metallic hand plane with a PVC coating.

Q12 (1 points)
The application does not meet requirement of article 82 EPC due to lack of unity between the subject-matter of claims 1 and 5.
Yes/No

Q13 (5 points)
You see today in EPO online file inspection for D2 that amended claims were filed by Mr Artisan during Substantive Examination.
Amended claim 1 of D2 now reads,
A metallic hand plane characterised in that is coated with a polymeric material.

If D2 is granted by the Examining Division with the amended claim 1, the resulting patent will

_____
Drag and drop from list.

- Constitute novelty destroying prior art against all claims of EP-X.
- Give Mr Artisan the right to market his metallic planes coated with any polymeric material in Europe.
- Constitute a danger of infringement for the business of X when manufacturing or selling metallic planes with a PTFE coating in Europe.

Q14 (5 points)
You see today in EPO online file inspection for D2 that amended claims were filed by Mr Artisan during Substantive Examination.
Amended claim 1 of D2 now reads,
A metallic hand plane characterised in that is coated with a polymeric material.
Company X is very worried about D2 now. What can X to do to successfully deal with the situation of D2.
Select one or more correct suggestions from list.

- File today observations as third party under article 115 EPC and argue lack of novelty of the amended claim 1 in D2 in view of EP-X.
- Await any grant of D2 and file an opposition under article 100(c) arguing that claim 1 is not in conformity with article 123(2) EPC.
- Request Oral proceedings now before the Examining Division in charge of D2.

Q15 (1 points)
Claim 5 relates to an act performed by a human being and is excluded from patentability by article 53(c) EPC.
Yes/No

Model solution Mock M1 – Part 2
Questions

1. A new set of claims as indicated above fulfilling the requirements of the EPC. (20 points)

Claims

1. A tubular ~~golfclub~~ shaft made of a matrix of polymeric material and reinforcement fibres, ~~characterised in that~~ wherein hollow glass microspheres are incorporated into the matrix, and

~~2. A tubular golfclub shaft according to claim 1 further characterised in that~~ the reinforcement fibres are made of glass or carbon,

~~3. A tubular golfclub shaft according to claim 1 or 2 further~~ **characterised in that** the polymeric material is polyester and the microspheres are between 200 and 400 micrometres in diameter, or the polymeric material is epoxy and the microspheres are between 20 and 80 micrometres.

~~4. A tubular golfclub shaft according to any previous claim, further characterised in that the hollow glass microspheres are between 1 and 1 000 micrometres in diameter.~~

Clean version

1. A tubular shaft made of a matrix of polymeric material and reinforcement fibres, wherein hollow glass microspheres are incorporated into the matrix, and the reinforcement fibres are made of glass or carbon,

characterised in that

the polymeric material is polyester, and the microspheres are between 200 and 400 micrometres in diameter, or the polymeric material is epoxy and the microspheres are between 20 and 80 micrometres.

2. Clear argumentation in respect of novelty and inventive step of the claimed subject-matter over D1 and D2 following the standards set out in the Guidelines for Examination in the European Patent Office parts G VI & VII. **(15 points)**

Novelty

D1 discloses the features of the preamble of claim 1 (see paragraphs 2 and 4). In particular, either polyester or epoxy polymers may be used. Furthermore, D1

discloses that the glass microspheres have a size ranging between 1 and 1000 micrometres in diameters.
New claim 1 defines a microsphere diameter subrange of 200 to 400 micrometres for a polyester matrix, and a microsphere diameter subrange of 20 to 80 micrometres for an epoxy matrix.
Each of the two subranges of and of 20 to 80 micrometre is narrow compared to the range of D1 and far from the ends of the range. Furthermore, D1 does not disclose any specific examples. However, it may be considered that the skilled person would nonetheless contemplate working in the claimed ranges when trying to optimize the microsphere size.
However, claim 1 defines further the selection of the matrix material among polyester and epoxy, in combination with the selection of a specific diameter subrange. In other words, claim 1 defines a combination of a selection from a list and a selection from a set of subranges. This multiple selection is not disclosed in D1 and is a sufficient condition for novelty (Guidelines G-VI, 7(ii)(c)).

D2 does not disclose a tubular shaft. Therefore, the subject-matter of claim 1 is novel over D2 as well.

Inventive step
D1 is considered as the closest prior art because it has the most features in common with claim 1.
The effect of the distinguishing features of claim 1 is to reduce the vibrations in the shaft, as shown by extensive tests.
The problem to be solved may be regarded as how to improve the reduction of vibrations in tubular shafts.

D1 discloses a broad diameter range, but it does not disclose that the amount of vibration reduction is dependent on the diameter of the microsphere. D1 does not teach that the effect might be different depending on the material of the matrix either.
Therefore, the skilled person would not arrive at the claimed invention from the teaching of D1 alone.
D2 discloses two examples of microspheres with a diameter within the two claimed subranges. However, D2 is in the very different field of construction of buildings, and the glass microsphere are used to solve a different problem, namely to reduce the weight of concrete structures. Therefore, the skilled

person would not consult D2 in trying to solve the technical problem starting from D1. Even the skilled person would consult D2, they would not find any hint towards the combination of the 50 micrometre diameter with an epoxy matrix and of the 300 micrometre diameter with a polyester matrix in a tubular shaft.
Consequently, the subject-matter of claim 1 is inventive.

3. Arguments in support of conformity with Article 123(2) EPC for the new set of claims. The basis in the application as originally filed for the amendments should be clearly and fully indicated (Article 123(2) EPC and Rule 137(4) EPC) following the standards set out in the Guidelines for Examination in the European Patent Office part H. **(10 points)**

New claim 1 is based on original claim 1 in combination with dependent claims 1 to 3, which combination is originally disclosed. The characterizing part is based on the table.
The term “golfclub” has been deleted. The removed feature was not described as essential to the invention, is not indispensable for the reduction of vibrations, and no modifications of the other features is required.
Indeed, the last paragraph of the description discloses that the shaft of the invention may be employed in many other recreational and industrial applications which require the use of tubular shafts, such as for fishing rods, umbrellas, tennis rackets and vaults for pole vault competitions, to dampen undesired vibrations.
Thus, the generalisation to tubular shaft was originally disclosed and satisfies the requirements of Art. 123(2) EPC (see Guidelines H-V, 3.1).

Claim 4 has been deleted because it would have been inconsistent with new claim 1.

4. Please also explain how the new, amended claims cover our tubular shafts for very long flag poles. **(5 points)**

New claim 1 relates to a tubular shaft. It is not limited to golfclub shafts. The length of the shaft is not limited either and may be 10 meters or more.
Your flag poles are tubular shafts with a matrix of epoxy material and carbon fibre reinforcement and comprising glass microspheres with a diameter of 50 micrometres. Therefore, your flag poles fall within the scope of the second alternative in claim 1.