Examiners' Report Paper A 2016 (Electricity/Mechanics)

CONTENT

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 a siphon for guiding waste water from a sink or toilet to a sewage system. On the one hand, such a siphon has thus to establish fluid communication for liquid from its inlet opening, which is connected to e.g. the plughole of a sink, to its outlet opening, which is connected to e.g. a sewage duct in a bathroom wall. On the other hand, such a siphon should prevent flow of gas from its outlet opening to its inlet opening in order to prevent bad odours from the sewage system reaching the bathroom. This is generally achieved by guiding the liquid not directly from the inlet to the outlet opening, but via a reservoir, in which a certain amount of liquid is stored, up to an overflow level. By appropriately shaping the siphon, bad odours from the sewage system can be blocked by the liquid stored in the reservoir in cooperation with the siphon walls. Such a siphon needs thus to fulfil three basic functions:

- draining liquid,
- storing liquid / housing a reservoir for the liquid,
- blocking gas in cooperation with stored liquid.

The client describes two examples of siphons according to his invention. The first example is described in conjunction with Figs. 2A to 5A and 2B to 5B. The second example is described in conjunction with Figs. 2C to 5C. The second example is based on the first example, but in addition comprises a valve, which makes it suitable for use in waterless urinals. The client's letter describes four embodiments for each example.

1.2 Prior Art

1.2.1 With reference to Figs. 1A and 1B, the client describes a conventional bath room or kitchen siphon as prior art. The siphon 100 is composed of an inlet tube 180, which connects an inlet opening 120 to the plughole 70 of a sink 80, a U-bend 160, which houses a reservoir 140 for liquid, and an outlet tube 190, which connects an outlet opening 130 to a sewage duct 90 in a bathroom wall 60.

1.2.2 With reference to Fig. 1C, the client refers to a modified version 100' of the conventional siphon of Figs. 1A and 1B, which comprises in addition a housing 110 for the U-bend 160. The siphon 100' has not been publicly available and does thus not constitute prior art. From the client's letter, it is, however, clear that the siphon 100' does not involve an inventive step with regard to the conventional siphon 100: It is the result of an *obvious* attempt to solve a non-technical problem (aesthetic look), a *straight-forward* solution to this non-technical problem, which still suffers from the same technical drawbacks as the conventional siphon 100 (bulky shape).

1.3 Challenges of the Paper

1.3.1 An independent claim should be drafted, which contains the features necessary for fulfilling the three basic siphon functions. On the one hand, it would be reasonable to refer in some way to the liquid in the reservoir in order to define a siphon in broad functional terms. On the other hand, for reasons of clarity, a device should generally not be claimed "in use", or, in other words, any liquid should not be claimed as actually forming part of the siphon. The independent claim must of course further contain the differing features of the invention, which render the subject-matter of the independent claim new and inventive over the prior art. The differing features have to be common to all embodiments and should characterise a wall, which ensures the blocking function and can thus replace the bulky U-bend, but allows the siphon to be more compact.

1.3.2 Dependent claims should cover the specific aspects and advantageous features of the embodiments. The embodiments of Figs. 2C to 5C should be reflected in a group of dependent claims having a valve feature in common. A claim to a waterless urinal can only refer to claims of this group of claims. The various combinations and dependencies with regard to the inlet opening, the inlet tube, the tubular wall extending through this inlet opening, and the valve seat located at the end of one of these tubes require an accurate structure of the dependent claims in order to be covered. In particular, as shown in Fig. 3C, an inlet tube (380) can be “prolongated” into the siphon housing (310) by a tubular wall (360), which in turn has a valve seat (372) at the other end. The tubular wall (360) is exposed on the inside to gas from the inlet opening (320) and on the outside to gas from the outlet opening (330). On the other hand, as shown in Fig. 2C, an inlet tube (280) can extend into the siphon housing (210) and have a valve seat (272) at one end without representing such a tubular “blocking” wall: Both sides of the inlet tube (280) are exposed to gas from the inlet opening (220), and the inlet tube (280) does not prevent – in cooperation with liquid in the reservoir (240) - that gas from the outlet opening (230) reaches the inlet opening (220). These characteristics and functionalities are only provided by the blocking wall (260): the space limited by the housing (210), the tubular wall (280) and the blocking wall (260) is not a vacuum, but filled with gas / air having entered and entering via the inlet opening (220), whenever the valve(270) is open. The wall (260) is exposed on one side to this gas and on its other side to gas from the outlet opening (230). Together with liquid in the reservoir (240), the wall blocks bad odours from the sewage system (90).
Furthermore, dependent claims should be directed to particularly compact arrangements obtained by an inlet opening configured to connect directly to a sink or toilet as well as by a separate reservoir side wall.

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 **40 marks** are available for a set of dependent claims, and
up to **10 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 siphon.

Where an answer paper has an additional independent claim in a different category, e.g. a method of draining waste water, 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. 2A to 5A, 2B to 5B on the one hand and the example shown in Figs. 2C to 5C 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) *Siphon (200, 200', 300, 300', 400, 400', 500, 500') comprising a housing (250, 350, 450, 550)*

(b) having an inlet opening (220, 320, 420, 520) and an outlet opening (230, 330, 430, 530)

(c) and enclosing a reservoir (240, 340, 440, 540),

(c1) which reaches to an overflow level (250, 350, 450, 550),

(b1) the inlet and outlet openings being arranged such that liquid can flow from the inlet opening to the outlet opening via the reservoir, and

(d) a wall (260, 360, 460, 560) being arranged such that,

(d1) if the reservoir is filled with liquid up to the overflow level,

(d2) the wall is exposed on one side to gas entering the housing from the inlet opening and on the other side to gas entering the housing from the outlet opening,

(d3) so that the wall and the liquid prevent gas from flowing from the outlet opening to the inlet opening.

2.2 Equivalent / non equivalent wording of example solution

In the following notes, remarks are made on 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 features (a) to (c)

The general concept of a siphon is defined in features a), b), c), b1), c1). It is thus not necessary to label the claimed device as "siphon". On the other hand, when using the term "siphon", it is theoretically not necessary to mention the features "housing", b), c), b1), c1) in order to define a siphon. It seems, however, difficult, to clearly define the invention in the independent claim and the various embodiments in the dependent claims without introducing the features "housing", b), b1), c), c1) for defining a siphon and referring to them.

Equivalents for features (a): *device / siphon for draining waste water / liquid; device / siphon for draining waste water / liquid; device for draining liquid from a sink / toilet to a sewage system / duct; drainage device; device; housing; connectable to a sink / a sewage duct*.

Non equivalents for features (a):
- *device / siphon draining liquid*: claiming the device in use (lack of clarity, see 2.6.4)
- *device / siphon connected to a sink / a sewage system*: definition by reference to external features (lack of clarity, see 2.6.5)

Equivalents for features (b):

- *inlet / outlet; inlet / outlet aperture*
- *inlet opening arranged in the top of the housing or a housing side wall*;
- *inlet opening arranged above the outlet opening*;

Non equivalents for features (b): *connected to a sink / a sewage system*: definition by reference to external features (lack of clarity, see 2.6.5)

Equivalents for features (c): *including / containing a liquid store / storage*

Equivalents for features (c1):

- *having / comprising / defining an overflow*
- *a reservoir side wall defining an overflow level* (as long as it is not specifically a separate or internal reservoir side wall).

Non equivalents for features (c1): *an overflow defined by the housing* / *the housing defines an overflow level* excludes embodiments with an internal reservoir, which defines the overflow level and is completely separated from the housing: no penalisation, since no such embodiment is depicted.

Equivalents for features (b1): *the inlet and outlet aperture being (arranged) in fluid communication with the reservoir* [if the claimed device is a siphon]

Non equivalents for features (b1): *the inlet and outlet aperture being (arranged) in fluid communication with the reservoir* [if the claimed device is not a siphon], lack of clarity (see 2.6.6)

Remarks to feature (d)

The term "*wall*" is considered to represent a concept which also includes (as possible work-arounds of the embodiments shown) several plate-shaped or tube-

shaped layers, which may even be arranged spaced apart from each other. The U-bend known from the prior art also qualifies as sort of "*wall*". The wall can be defined as being part of the siphon, part of the housing or as being enclosed by the housing.

Equivalents: *wall structure, partition wall, partition, interior wall*

Remarks to feature (d1)

Feature (d1) is a necessary condition for clearly defining the arrangement of the wall in broad functional terms without merely claiming the result to be achieved. Without feature (d1), features (d2) and (d3) lack clarity. Feature (d1) does not exclude embodiments with a wall extending beyond the overflow level into the reservoir, such as shown in Figs. 2 and 5B, where the wall fulfils its blocking function even if the reservoir is not filled up to the overflow level. It only defines a state in which all embodiments of the invention have to work at least.

Non equivalents:
- leaving out the entire feature (d1): lack of clarity (see 2.6.2, 2.6.3, 2.6.4);
- leaving out the condition (*if)*, claiming the liquid as part of the siphon: lack of clarity (see 2.6.6)
- *when in use*: does not necessarily imply that the reservoir is filled up to the overflow level, could also mean "when mounted": lack of clarity (see 2.6.6)

Remarks to feature (d2)

The feature is essential for establishing novelty and inventive step over the prior art siphon of Figs. 1A and 1B. Firstly, since it refers to gas *entering* the housing, it implies that the wall is inside the housing. The provision of an obstructive wall *within a housing* is new with regard to the conventional siphon, but not inventive as such: the obvious modification of Fig. 1C also comprises a wall, i.e. the U-

bend 160, within a housing 110. Only the “shrinking” of this internal U-bend 160 in a further step to a simple wall structure, such as a partition or a tube, each side of which is exposed to a different housing opening, allows to solve the problem of making the inventive siphon more compact than the conventional siphon. An independent claim comprising feature (d2) is novel and inventive, even if features (d1) and (d3) are missing. However, without feature (d1), feature (d2) and all equivalents indicated, below, lack clarity. These cases are dealt with under lack of clarity (see 2.6.2, 2.6.4).

Equivalents [with feature (d1) present]:

- the wall is exposed on one side / a first side to gas entering the housing (only) from the inlet opening, and exposed on the other side / on its other side / on another side / on the opposite side / on its opposite side / on a second side to gas entering the housing (only) from the outlet opening;

- one side / a first side of the wall is (at least partly) exposed to gas entering the housing from the inlet opening, the other / another / the opposite / a second side of the wall is (at least partly) exposed to gas entering the housing from the outlet opening;

- one side / a first side of the wall faces a space, which is in fluid communication with the inlet opening, the other / another / the opposite / a second side of the wall faces a space, which is in fluid communication with the outlet opening;

- the wall separates the space between the overflow level and the top of the housing into a part / portion, in which gas can enter (only) from the inlet opening, and a part / portion, in which gas can enter (only) from the outlet opening;

- the wall separates the space between the overflow level and the top of the housing into a part / portion, which is in fluid communication with the inlet opening, and a part / portion, which is in fluid communication with the outlet opening

- the wall extends inside the housing from the housing / a housing wall at least to the overflow level, where it is ending freely.

Non equivalents:

- the wall is exposed on one side to gas entering the housing from the inlet opening and/or *exposed on one side to gas entering the housing from the outlet opening*: lack of novelty (see 2.4)

- one side of the wall faces a space, which is in fluid communication with the inlet opening, and one side of the wall faces a space, which is in fluid communication with the outlet opening: lack of novelty (see 2.4)

- one side of the wall is fully / completely / entirely exposed to gas entering the housing from the inlet opening, the other side of the wall is fully / completely / entirely exposed to gas entering the housing from the outlet opening: excludes embodiments with walls extending beyond the overflow level into the reservoir, unnecessary limitation (see 2.3.1)

- the wall separates a space (within the housing) in fluid communication with the inlet opening from a space (within the housing) in fluid communication with the outlet opening: lack of novelty (see 2.4.1, 2.4.2)

- the wall defines / limits a space (within the housing), in which gas can enter from the inlet opening, and a space, in which gas can enter from the outlet opening: lack of novelty (see 2.4.1, 2.4.2)

- the wall defines / limits a space (within the housing) in fluid communication with the inlet opening and a space in fluid communication with the outlet opening: lack of novelty (see 2.4.1, 2.4.2)

- the wall is inside the housing / an interior wall / a partition wall / a partition: lack of inventive step (see 2.5)

- within the housing, the wall separates a space in fluid communication with the inlet opening from a space in fluid communication with the outlet opening: lack of inventive step (see 2.5)

- the wall separates the remaining space within the housing / the space between overflow level and top of the housing into a part / portion, which is in fluid communication only with the inlet opening, and a part / portion, which is in fluid communication only with the outlet opening: contradiction to feature (b1), risk to exclude all embodiments, lack of clarity (see 2.6.2)

Remarks to feature (d3)

Together with feature (d1), feature (d3) ensures the blocking function and implies ("*together with the liquid*") that the wall is not gas-permeable and extends (at least) to the overflow level.
Even if an independent claim is directed to *a siphon for draining waste water / liquid to a sewage system / duct*, features (d1) and (d3) cannot - unlike features (a) to (c) – be considered as implicit features of such a siphon, since feature (d3) does not define the siphon in general, but the arrangement of a specific blocking wall within a housing of the siphon. Consequently, if feature (d3) is totally missing (i.e. also in equivalent form), the independent claim lacks essential features with regard to the realisation of the blocking function by means of the wall. As for feature (d2), if feature (d1) is missing, feature (d3) lacks clarity (see 2.6.4).

Equivalents:
- features (d1) and (d2) and "*the wall is configured / arranged to prevent gas from flowing from the outlet to the inlet opening*"
- features (d1) and (d2) and "*the wall is gas-tight / not gas-permeable and extends at least to the overflow level*"
- feature (d1) and limited feature (d2) "*exposed on one side only to gas entering the housing from the inlet opening, exposed on the other side only to gas entering the housing from the outlet opening"*
- feature (d1) and limited feature (d2) "*separating the remaining space within the housing / the space between overflow level and top of the housing into a part / portion, in which gas can only enter from the inlet opening, and a part / portion, in which gas can only enter from the outlet opening*

Non equivalents:
- features (d1) and (d2), leaving out feature (d3): lack of clarity (see 2.6.3)
- features (d1) and (d2) and "*the wall extends (at least) to the overflow level*": lack of clarity (see 2.6.3)

- feature (d2) and "*the wall extends (at least) to the overflow level*": lack of clarity (see 2.6.3)
- feature (d2) and "*so that the wall prevents gas from flowing from the outlet to the inlet opening*": lack of clarity (see 2.6.2)
- feature (d2) and "*the wall is configured / arranged to prevent gas from flowing from the outlet to the inlet opening*": lack of clarity (see 2.6.2)

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 not clear so that it is arguable whether or not the claim is unnecessarily limited by that feature, then this is considered as lack of clarity (see 2.6) and not as unnecessary limitation.

2.3.1 Where a claim is unnecessarily limited to the extent that one of the eight embodiments specifically illustrated in Figs. 2A to 5A, 2B to 5B and in Figs. 2C to 5C of the client's letter is not covered by the claim, then 10 marks are deducted for each embodiment which is not covered.

Examples:

A. the wall is a plate / straight / flat (-50 marks for excluding the six embodiments of Figs. 3 to 5)

B. the wall is tubular (-20 marks for excluding the two embodiments of Figs. 2);

C. the wall extends from the inlet opening / surrounds the inlet opening (-20 marks for excluding the two embodiments of Figs. 2);

D. the wall extends from a side wall of the housing (-50 marks for excluding the six embodiments of Figs. 2, 4 and 5)

E. the wall extends from the top of the housing (-20 marks for excluding the two embodiments of Figs. 3)

F. one side of the wall is fully / completely / entirely exposed to gas entering the housing from the inlet opening, the other side of the wall is fully / completely / entirely exposed to gas entering the housing from the outlet opening (- 30 marks for excluding the three embodiments of Figs. 2B, 2C and 5B)

G. the inlet opening is arranged in a side wall of the housing (-50 marks for excluding the six embodiments of Figs. 2, 4 and 5)

H. the inlet opening is arranged in the top of the housing (-20 marks for excluding the two embodiments of Figs. 3)

I. the outlet opening is arranged in a bottom of the housing (-50 marks for excluding the six embodiments of Figs. 2, 3 and 5)

J. the outlet opening is arranged in a side wall of the housing (-20 marks for excluding the two embodiments of Figs. 4)

K. the siphon comprises an inlet tube (-40 marks for excluding the four embodiments of Figs. 4 and 5);

L. the siphon comprises an inlet tube extending through the inlet opening (into the housing) (-50 marks for excluding the five embodiments of Figs. 2A, 2B, 4 and 5);

M. the siphon comprises a separate reservoir side wall (-40 marks for excluding the four embodiments of Figs. 2 and 3);

N. the siphon comprises a valve (-40 marks for excluding the four embodiments of Figs. 2A to 5A, 2B to 5B).

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:

O. a specific shape of the housing, e.g. cylindrical (-10 marks for excluding embodiments having another shape of housing, e.g. conical or spherical);

P. the siphon comprises an outlet tube (-10 marks for excluding embodiments configured to directly connect to a sewage duct).

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 conventional prior art siphon of Figs. 1A and 1B:

(a) The conventional siphon 100 comprises a housing 160
(b) having an inlet opening 120 and an outlet opening 130,
(c) and enclosing a reservoir 140,
(c1) which reaches to an overflow level 150,
(b1) the inlet and outlet openings 120, 130 being arranged such that liquid can flow from the inlet opening to the outlet opening via the reservoir 140,
(d), (d1), (d3) and siphon walls, namely the inlet and outlet tubes 180, 190, and walls of the U-bend 160, which are arranged such that, if the reservoir is filled with liquid up to the overflow level, the walls prevent gas from flowing from the outlet opening to the inlet opening.
(d2') A wall of the U-bend 160 is exposed on one side, namely its inner side, to gas entering the U-bend (housing) from the inlet opening 120, and to gas entering the U-bend (housing) from the outlet opening 130.
Furthermore, siphon walls extend (at least) to the overflow level 150.

In the conventional siphon 100, there is no wall, which is exposed on one side to gas entering the housing / U-bend 160 from the inlet opening 120 and on the other side to gas entering the housing from the outlet opening 130 (feature (d2)). Furthermore, there is no wall inside a housing, interior wall or partition wall.

2.4.2 The following is noted regarding the modified conventional siphon of Fig. 1C: the siphon 100' has not been publicly available and does thus not constitute prior art.

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 an item 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 lack of inventive step (see 2.5) or lack of clarity (see 2.6).

2.5 Lack of Inventive Step (-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.
An independent claim defining a wall within the housing but lacking at least part of feature (d2) or one of its equivalents, i.e. which defines a siphon according to Fig. 1C, but not according to Figs. 1A and 1B, is such a case.

(a) The modified conventional siphon 100' of Fig. 1C comprises a housing 110
(b) having an inlet opening 120 and an outlet opening 130,
(c) and enclosing a reservoir 140,
(c1) which reaches to an overflow level 150,
(b1) the inlet and outlet openings 120, 130 being arranged such that liquid can flow from the inlet opening to the outlet opening via the reservoir 140, and
(d), (d1), (d2'), (d3) a wall 160, which is arranged such that, if the reservoir 140 is filled with liquid up to the overflow level 150, the wall is exposed on one side, namely its inner side, to gas entering the housing from the inlet opening 120 and to gas entering the housing from the outlet opening 130, so that the wall and the liquid prevent gas from flowing from the outlet opening to the inlet opening. Furthermore, the wall 160 is inside the housing 110, i.e. is an interior or partition wall, is gas-tight and extends to an overflow level. These features are thus not suitable for distinguishing a claimed siphon from the example of Fig. 1C.

In the modified conventional siphon, there is no wall, which is exposed on one side to gas entering the housing / U-bend 160 from the inlet opening 120 and on the other side to gas entering the housing from the outlet opening 130 (feature (d2)).

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:
A siphon comprising features (a) to (c) and a wall arranged inside the housing in a compact manner / and a compact wall arrangement within the housing.

2.6.2 Claims risking to exclude all embodiments

Claims defining a wall, which - in contradiction to feature (b1) - blocks any fluid communication between inlet and outlet opening, risk to exclude all embodiments of the invention. This could occur, if feature (d1) was missing and if it could also not be derived from other claim features that the wall arrangement was defined under the condition “filled with liquid”, e.g. if liquid was also not mentioned in feature (d3). 30 marks are deducted in these cases of severe lack of clarity.

Examples:
Missing feature (d1) and including the following equivalents of feature (d2) and/or non equivalent of feature (b3) (-30 marks):

- *the wall is exposed on one side only to gas entering the housing from the inlet opening, and exposed on the other side only to gas entering the housing from the outlet opening*;

- the wall separates the space between overflow level and top of the housing into a part / portion, in which gas can enter only from the inlet opening, and a part / portion, in which gas can enter only from the outlet opening;

- so that the wall prevents gas from flowing from the outlet opening to the inlet opening;

- the wall is configured / arranged to prevent gas from flowing from the outlet to the inlet opening.

Non equivalent feature (d2) (-30 marks):

- the wall separates the remaining space within the housing / the space between overflow level and top of the housing into a part / portion, which is in fluid communication only with the inlet opening, and a part / portion, which is in fluid communication only with the outlet opening.

2.6.3 Claims not clearly defining the arrangement of the wall

The arrangement of the wall as partition within the housing can only be clearly defined by features (d2) and (d3), if feature (d1) is present in a claim. On the other hand, a claim including feature (d1) needs also feature (d3) - either literally or incorporated in a more limited equivalent of feature (d2) (see 2.2) - in order to clearly define the wall arrangement. Lack of clarity with regard to the definition of the wall arrangement leads to a deduction of 10 marks.

Examples:

Missing feature (d1) and including feature (d2) or the following equivalents thereof (-10 marks):

- one side of the wall is (at least partly) exposed to gas entering the housing from the inlet opening, the other side of the wall is (at least partly) exposed to gas entering the housing from the outlet opening;

- the wall separates the space between overflow level and top of the housing into a part / portion, in which gas can enter from the inlet opening, and a part / portion, in which gas can enter from the outlet opening;

- the wall separates the space between overflow level and top of the housing into a part / portion, which is in fluid communication with the inlet opening, and a part / portion, which is in fluid communication with the outlet opening.

Missing feature (d1) and including feature (d2) and the following non equivalent of feature (d3) (-10 marks):

the wall extends (at least) to the overflow level.

Missing feature (d1) and including feature (d2) and the following equivalent of feature (d3) (-5 marks):

the wall is gas-tight / not gas- permeable and extends (at least) to the overflow level.

Including features (d1) and feature (d2) and the following non equivalent of feature (d3) (-5 marks):

the wall extends (at least) to the overflow level.

Missing feature (d3) and including features (d1) and (d2) (-10 marks).

2.6.4 Claims defining the device in use

Claims defining liquid as part of the siphon lose 10 marks.

Example:

- the reservoir is filled with liquid up to the overflow level

In other cases, 5 marks are deducted.

Example:

A siphon draining liquid

2.6.5 Definition by reference to external features

Claims defining a siphon by means of its relative arrangement with regard to external features, which do not form part of the subject-matter of claim 1 (e.g. to a sink and/or to a sewage system), lose 10 marks.

Example:
Siphon comprising a housing / an inlet opening / an outlet opening connected to a sink / a sewage system.

2.6.6 Other Clarity Issues

A claim not defining the draining function, e.g. if the claimed device is not called a "siphon" and feature (b1) is not present or replaced by "*the inlet and outlet aperture being (arranged) in fluid communication with the reservoir"* lacks clarity, (-10 marks).

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

Examples:
Replacing feature (d1) with *when in use.*

2.7 Formal Matters (up to -5 marks)

2.7.1 For the example solution it is considered appropriate to use a one-part form for the independent claim for reasons of clarity and conciseness. The siphon of Fig. 1C of the client's letter, which has most features in common with the invention, does not form part of the prior art according to Article 54(2) EPC.

However, using a two-part form is not penalised as long as it is correct with regard to the conventional siphon of Figs. 1A, B of the client's letter. It is noted

that a conventional siphon fulfils the functional feature (d3). An incorrect two-part form 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 40 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 merit 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).

Inlet opening / connection of the siphon to a sink (**up to 5 marks**)

The embodiments of Figs. 2, 4 and 5 have a top side inlet opening and are thus suitable to be connected directly to a sink or toilet bowl. The top side arrangement of the inlet opening enables a siphon with small horizontal dimensions. As demonstrated by the embodiment of Fig. 3, an inlet tube needs to be present, if the inlet opening is arranged elsewhere in the housing.

2 inlet opening is arranged in the top of the housing (**up to 1 mark**)

3 top of the housing and inlet opening are configured to directly connect to a sink or toilet bowl (**up to 2 marks**)

4 inlet tube extending from the inlet opening and being adapted at the end outside the housing to connect to a sink (**up to 2 marks**)

NB: 3 can only refer to 2 or combinations of claims necessarily including an inlet opening in the top of the housing;
4 must not refer to 3 (alternative solution).

Tubular wall (**up to 4 marks**)

A tubular wall is present in the embodiments of Figs. 3 to 5. Figs. 3A and 3B show a tubular wall integral with the inlet tube, which eases manufacturing of the

siphon (see paragraph [011] of the client's letter). The tube in Fig. 2C is not such an integral tube, since it does not extend to the overflow level, which is a necessary condition for the wall according to claim 1.

5 wall is tubular and one end of the tubular wall surrounds the inlet opening (**up to 2 marks**)

6 tubular wall and inlet tube are integrally formed (**up to 2 marks**)

NB: 6 can only refer to 5 and 4 or combinations of claims necessarily including a tubular wall and an inlet tube.

Separate reservoir side wall (**up to 6 marks**)

These features are specific of the embodiments according to Figs. 4 and 5. They allow to obtain a siphon with small vertical dimensions (see paragraph [013] of the client's letter).

7 internal reservoir side wall separate from a housing side wall and defining the overflow level (**up to 3 marks**)

8 outlet opening is at least partly arranged in an area of the housing side wall between the bottom of the housing and the overflow level (**up to 3 marks**)

NB: 8 can only refer to 7 or combinations of claims necessarily including a separate reservoir side wall (see Fig. 5B).

Valve (**up to 10 marks**)

The valve claim should cover all the embodiments of Figs. 2C to 5C. It represents an important fall-back position. All the detailed siphon features of the dependent claims above can be realised in combination with a valve inside the housing. The full 10 marks are available for a clear definition of the valve and its function,

introducing the concept of float and buoyancy. Since every valve has a valve body and a valve seat, the claim is not considered to be over restricted by these features. Their introduction facilitates the drafting of the dependent valve claims. A full functional definition also defining the opening position of the valve does not lead to a loss of marks. The valve can also be defined in several dependent claims with a maximum of 10 marks available for all these claims.

9 valve having
a float, which serves as valve body,
is arranged in the reservoir and
configured to be biased by buoyancy against a valve seat
into a closed position, in which it blocks the inlet opening,
if the reservoir is filled with liquid (**up to 10 marks**)

Valve seat (**up to 8 marks**)

Two favourable alternative arrangements for the valve seat are possible. In embodiments comprising an inlet tube, this tube can extend through the inlet opening into the housing. The end of the inlet tube inside the housing can serve as a valve seat at a suitable height on top of the overflow level and thus the liquid level in the reservoir (see Fig. 2C). In embodiments comprising a tubular wall, the end of the tubular wall inside the housing can serve as a valve seat provided that it does not extend beyond the overflow level (see Figs. 3C to 5C, paragraph [019] of the client's letter). Otherwise residual liquid might remain on top of the valve body in the closed position and cause undesired bad odours.

10 inlet tube extends through the inlet opening into the housing, and
the valve seat is located at the other end of the inlet tube
(**up to 4 marks**)

11 tubular wall extends to the overflow level, and the valve seat is
located at the other end of the tubular wall (**up to 4 marks**)

NB: 10 can only refer to 9 and 4 or combinations of claims necessarily including a valve seat and an inlet tube;
11 can only refer to 9 and 5 or 6 or combinations of claims necessarily including a valve seat and a tubular wall.

Valve body guide (**up to 5 marks**)

Three alternative arrangements for the guide are possible. A separate guide can be provided as shown in Fig. 3C. If the wall is suitably arranged as in Fig. 2C, it can serve as a guide. If a reservoir side wall is present as in Figs. 4C and 5C, it is advantageous to use it as a guide for the valve body floating in the reservoir.

12 valve comprises a guide for the valve body (**up to 1 mark**)

13 wall forms the guide for the valve body (**up to 2 marks**)

14 reservoir side wall forms the guide for the valve body (**up to 2 marks**)

NB: 12 can only refer to 9 to 11 or combinations of claims necessarily including a valve;
13 can only refer to 12 or combinations of claims necessarily including a guide;
14 can only refer to 12 and 7 or 8 or combinations of claims necessarily including a guide and a separate reservoir side wall;
14 must not refer to 13 (alternative solution).

Waterless urinal (**up to 2 marks**)

15 Waterless urinal comprising a siphon... (**up to 2 marks**)

NB: 15 can only refer to 9 to 14 or combination of claims necessarily including a valve.

3.3 Other dependent claims offering a useful fall-back position (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 **40** 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 or not inventive because feature (d2) is missing, a dependent claim to this feature is an important fall-back position for the applicant (**up to 5 marks**).

Further examples of dependent claims offering useful fall-back positions for the example independent claim:

... the inlet opening is located in a side wall of the housing (up to 2 marks),

... the outlet opening is located in a bottom wall of the housing (up to 2 marks),
NB: can only refer back to 7 or combination of claims necessarily including a separate reservoir side wall

... the wall is straight (up to 1 mark).

All the examples have in common that the additional features are not shown in Figs. 1B and/or 1C.

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:

... the outlet opening is located in a side wall of the housing (see Fig. 1C).

... the outlet opening determines an overflow level

... the inlet opening is arranged above the outlet opening

... the housing comprises a reservoir side wall defining an overflow level (without specifying that the reservoir side wall is a separate or internal wall)

... the wall is curved / bent (see Figs. 1).

... the housing is cylindrical (see Fig. 1C) or other shape (aesthetic feature).

4. DESCRIPTION (10 marks available)

4.1 For an **acknowledgement of prior art**, **2 marks** are available. Full marks in this section are available for a description and explanation of a conventional siphon, from which it is derivable which of the features of the independent claim are known from the conventional siphon (see GL F-IV, 2.3.2). For the example solutions, all features apart from (d2) should be mentioned in connection with a conventional siphon.

Any reference to the “internal” state of the art shown in Fig. 1C does not receive any credit. If the example of Fig. 1C is presented as closest prior art, no marks are awarded under this section.

4.2 A total of **3 marks** are available for the **definition of the problem**.

The following disadvantages of the conventional siphon are mentioned in the client’s letter, paragraph [005]: “bulky”, “determines minimum distance between plughole and wall” and “limits possible arrangements of the sink”. The following

advantages of the inventive siphon are mentioned in paragraphs [012], [013]: “more compact”, “reduced height”, “reduced minimum distance”. Furthermore, it follows from the statement in paragraph [009] “the inlet and outlet openings could be located differently”, that the inventive siphon provides a more flexible arrangement of inlet and outlet openings which can cope with various mounting situations, positions of sewage ducts and sink designs.

General problems such as "providing an improved siphon", “meeting customer’s demands” do not receive any marks. Answer papers defining i.a. a non-technical, aesthetic problem such as “providing a siphon with clean and straight contours” do not receive full marks under this section.

4.2.1 For the example solution independent claim, a deduction of the problem can be as follows: conventional siphons suffer – due to the presence of the U-bend – from a rather voluminous shape and require predetermined positions of the sewage duct and the plug hole of a sink. In order overcome these disadvantages, the invention proposes a siphon according to claim 1, which is more compact and offers more flexibility with respect to its connection to sewage ducts and sinks.

4.3 A total of **5 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 the solution can be as follows: the U-bend can be replaced by a more compact housing for the reservoir, if a wall is arranged in the housing which fulfils – together with liquid in the reservoir - the blocking function of the U-bend, i.e. blocking bad

odours from the sewage system. In order to do so, the wall has to be arranged such that it is exposed on one side to gas entering the housing from the inlet opening and on its other side to gas entering the housing from the outlet opening. Since the shape of such housing is not determined any more by the blocking function, it can be freely chosen and provides many possible positions for the inlet and outlet openings.

5. ANNEX - EXAMPLE SET OF CLAIMS

1. Siphon (200, 200', 300, 300', 400, 400', 500, 500') comprising
a housing (250, 350, 450, 550) having an inlet opening (220, 320, 420, 520) and an outlet opening (230, 330, 430, 530), and enclosing a reservoir (240, 340, 440, 540), which reaches to an overflow level (250, 350, 450, 550),

- the inlet and outlet openings being arranged such that liquid can flow from the inlet opening to the outlet opening via the reservoir,

a wall (260, 360, 460, 560) being arranged such that, if the reservoir is filled with liquid up to the overflow level, the wall is exposed on one side to gas entering the housing from the inlet opening and on the other side to gas entering the housing from the outlet opening,
so that the wall and the liquid prevent gas from flowing from the outlet opening to the inlet opening.

2. Siphon (200, 200', 400, 400', 500, 500') according to claim 1, wherein
the inlet opening (220, 420, 520) is arranged in the top of the housing (210, 410, 510).

3. Siphon (400, 400', 500, 500') according to claim 2, wherein
the top of the housing (410, 510) and the inlet opening (420, 520) are configured to directly connect to a sink (80) or toilet bowl.

4. Siphon (200, 200', 300, 300') according to claim 1 or 2, comprising
an inlet tube (280, 380) extending from the inlet opening (220, 320) and being adapted at the end outside the housing (210, 310) to connect to a sink (80).

5. Siphon (300, 300', 400, 400', 500, 500') according to one of claims 1 to 4, wherein
the wall (360, 460, 560) is tubular and one end of the tubular wall surrounds the inlet opening (320, 420, 520).

6. Siphon (300, 300') according to claims 4 and 5, wherein
the tubular wall (360) and the inlet tube (380) are integrally formed.

7. Siphon (400, 400', 500, 500') according to one of claims 1 to 6, further comprising
an internal reservoir side wall (441, 541) separate from a housing side wall (411, 511) and defining the overflow level (450, 550).

8. Siphon (500, 500') according to claim 7, wherein
the outlet opening (530) is at least partly arranged in an area of the housing side wall (511) between the bottom of the housing (510) and the overflow level (550).

9. Siphon (200', 300', 400', 500') according to one of the preceding claims, comprising a valve (270, 370, 470, 570) having a float (271, 371, 471, 571), which serves as valve body, is arranged in the reservoir (240, 340, 440, 540) and is configured to be biased by buoyancy against a valve seat (272, 372, 472, 572) into a closed position, in which it blocks the inlet opening (220, 320, 420, 520), if the reservoir is filled with liquid.

10. Siphon (200', 300') according to claims 9 and 4, wherein
the inlet tube (280, 380) extends through the inlet opening (220, 320) into the housing (210, 310),

and the valve seat (272, 372) is located at the other end of the inlet tube.

11. Siphon (300', 400', 500') according to claim 9 and claim 5 or 6, wherein the tubular wall (360, 460, 560) extends to the overflow level (350, 450, 550), and the valve seat (372, 472, 572) is located at the other end of the tubular wall.

12. Siphon (200', 300', 400', 500') according to one of claims 9 to 11, wherein the valve (270, 370, 470, 570) comprises a guide (260, 373, 441, 541) for the valve body (271, 371, 471, 571).

13. Siphon (200') according to claim 12, wherein
the wall (260) forms the guide for the valve body (271).

14. Siphon (400', 500') according to claims 12 and 7, wherein
the reservoir side wall (441, 541) forms the guide for the valve body (471, 571).

15. Waterless urinal comprising a siphon (200', 300', 400', 500') according to one of claims 9 to 14.

EXAMINATION COMMITTEE I

Paper A (Electricity/Mechanics) - 2016 - Marking Sheet

Category	Maximum possible
Independent claim	50
Dependent claims	40
Description	10
Total	100