The examination is being carried out on the **following application documents**

Description, Pages

1-16 as published

Claims, Numbers

1-14 as published

Drawings, Sheets

1/4-4/4 as published

1 The application addresses the problem of "alpha sticking" in muon-catalysed fusion and aims at providing a cheaper and more energy-efficient way of producing muons (see page 1, lines 14-23). The invention is stated to be based on the realization that muons can be generated by accumulating ultra-dense hydrogen and subjecting the accumulated ultra-dense hydrogen to a perturbing field, such as an electromagnetic field, including purely electric or magnetic fields (see page 4, lines 13-17).

2 Claim 1 is directed to an apparatus for generating muons. The apparatus is defined to include in particular an "ultra-dense hydrogen accumulator", in which a "hydrogen transfer catalyst" is arranged within a "flow path" of the accumulator and causes a "transition of hydrogen from the gaseous state to an ultra-dense state", and a "field source [...] adapted to stimulate or induce emission of negative muons from hydrogen in the ultra-dense state". It is noted that its subject-matter does not further define:

I. the ultra-dense hydrogen state;

II. the specific material of the hydrogen transfer catalyst;

III. the nature of the field source; and

IV. which technical apparatus features make this field source adapted to stimulate or induce the negative muon emission.

Because all this information is missing, it is not clear which corresponding features are intended to be covered by this wording and the claim lacks of clarity under Art. 84 EPC.

3 Taking due account of the additional claims and of the description, it appears that:

I. hydrogen in an "ultra-dense state" should be understood as hydrogen in the form of a quantum material (quantum fluid) in which adjacent nuclei are within much less than one Bohr radius of each other, i.e. the nucleus-nucleus distance in the ultra-dense state is considerably less than 50pm (see page 2, lines 20-24);

II. the hydrogen transfer catalyst can be either styrene or metallic catalysts such as iridium and platinum (see page 3, lines 5-10);

III. the field source is a laser (see claims 12 and 13 and page 9, line 7); and

IV. the laser is a pulsed laser with pulse length in the nanosecond range, using visible or infrared light, with pulse energy of 200-400mJ, a pulse repetition rate of 10Hz, a total laser power of 2-4W and the laser beam being focused using a lens of 40-50mm focal length (see page 14, lines 17-28).

4 In view of what mentioned above, it is apparent that the core feature allowing to allegedly solve the problem faced by the application is the specific provision of a ultra-dense hydrogen state.

However, even though description ad drawings provide for some technical information related to how ultra-dense hydrogen is obtained via a reaction with a hydrogen transfer catalyst in a device as shown in fig. 2, the application does not provide any experimental evidence for the actual obtainment and accumulation of such ultra-dense hydrogen within such a device, with for example no information or measurement about temperature and density of such state. Also, the application does not include any detailed, step-by-step, method of how to operate the device of fig. 2 in order to indeed generate such ultra-dense hydrogen state.

Additionally it is also noted that, while most of the work dealing with ultra-dense hydrogen is found to be published by the present inventor or a few additional scientists who are co-authors of the inventor in several publications (see for example the references mentioned in the application), no additional independent confirmation could be found for the actual provision of such ultra-dense hydrogen.

Therefore the application is not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Art. 83 and Rule 42(1)(e) EPC).

5 Regarding the alleged additional evidence, filed in response to the invitation under Rule 63(1) EPC for supporting the existence of such a ultra-dense hydrogen state, it is noted that it is merely an additional work published again by the inventor of the present application, so that it cannot be used as representing a valid independent confirmation of the existence of such a state. Moreover, no additional information has been given regarding the detailed step-by-step method mentioned above.

It is further noted that, even if considering that the examining division is not in the position of judging the scientific content of the present application under the provisions of the EPC, it appears that the alleged ultra-dense hydrogen state merely represents a sort of "desiderata" for obtaining nuclear fusion, since the ultra-dense requirement is defined through the nucleus-nucleus distance as being considerably less than 50pm, i.e. exactly the conditions result obtained once the Coulomb forces between nuclei have indeed been overcome, so that fusion can indeed occur.

6 Because of what reported above, the present application fails to such an extent to comply with the EPC, that it is impossible to carry out a meaningful search regarding the state of the art for all the subject-matter claimed.

The objections raised above are such that there seem to be no possibility of overcoming them by amendments without contravening the requirements set forth by Article 123(2) EPC.