



30 September 2025

Examination report No. 1 for standard patent application

Delivering a world leading IP system

www.ipaustralia.gov.au

ABN: 38 113 072 755

Spruson & Ferguson

GPO Box 3898
Sydney NSW 2001
Australia

Your reference: P0034121AU
Application number: 2020372186
Applicant name: NewSouth Innovations Pty Limited
Earliest priority date: 21 October 2019

Final date for acceptance: 30 September 2026
Date of this report: 30 September 2025
Examination request date: 18 September 2024

Dear Spruson & Ferguson,

Your application has been examined under [section 45 of the Patents Act 1990](#). I consider that this application does not meet the requirements of the Act because there are issues with the application that are explained in the report details.

You have **12 months** from the date of this report to overcome all my objection(s) otherwise this application will lapse.

You will also need to pay any annual continuation fees that apply. Your next continuation fee is due on **21 October 2025**.

NOTE: There is a current postponement of acceptance in place. If you overcome all other objections before the expiration of that postponement, the Commissioner will only accept the application at that time if you have filed a clear and unambiguous statement requesting the withdrawal of that postponement. Otherwise, a further adverse report will be issued.

I apologise for any inconvenience resulting from this report not being issued within the response time published on the IP Australia website.

Your reference: P0034121AU

Application number: 2020372186

Details of this patent application can be viewed on [Australian Patent Search](#).

Yours sincerely,

Lloyd James

Section: CHEM 4 - POLYMERS & APPLIED CHEMISTRY

Phone: +61 2 6283 2335

Alternate contact: Tien Ngo

Phone: +61 2 6283 2243

Your reference: P0034121AU

Application number: 2020372186

Report details

Basis of the report

In examining this application I have considered:

- the PCT pamphlet as originally filed.

Summary of novelty, inventive step and patentable subject matter

	Satisfy requirements?	Claim numbers
Novelty/inventive step	Yes	NONE
	No	1-38
Patentable subject matter	Yes	1-38
	No	NONE

Detailed objections on issues that have been identified

Section 40 (support, disclosure, clarity, lack of unity)

- 1 The invention defined in claims 1-4, 8, 9 and 12-38 lacks support under subsection 40(3) for the reasons outlined in Box VIII of the IPRPI dated 26 April 2022. While not raised under Australian law, I agree with the reasons given in that report and consider that the same reasons provide the basis for a corresponding objection against the claims of the Australian application.

Documents cited or considered relevant

D1: ESRAFILZADEH DORNA, ZAVABETI ALI, JALILI ROUHOLLAH, ATKIN PAUL, CHOI JAECHOL, CAREY BENJAMIN J., BRKLJAČA ROBERT, O'MULLANE ANTH: "Room temperature CO₂ reduction to solid carbon species on liquid metals featuring atomically thin ceria interfaces", NATURE COMMUNICATIONS, 2019, vol. 10, article no. 865 ^[1]

Category: X Claims: 1-38

D2: TANG JIANBO, DAIYAN RAHMAN, GHASEMIAN MOHAMMAD B, IDRUS-SAIDI SHUHADA A, ZAVABETI ALI, DAENEKE TORBEN, YANG JIONG, KOSHY PRAMOD, C: "Advantages of eutectic alloys for creating catalysts in the realm of nanotechnology-enabled metallurgy", NATURE COMMUNICATIONS, vol. 10, 2019, article no. 4645, XP055814931 ^[1]

Category: X Claims: 1-38

D3: LI QINGQING, ZHANG YANXING, ZHANG XURUI, WANG HONGQIANG, LI QINGYU, SHENG JIAWEI, YI JIN, LIU YUYU, ZHANG JIUJUN: "Novel Bi, Bi₂Sn, Bi₃Sn, and Bi₄Sn Catalysts for Efficient Electroreduction of CO₂ to Formic Acid", INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH, vol. 59, 19 August 2019 (2019-08-19), pages 6806 - 6814 ^[1]

Category: X Claims: 1-38

D4: QIN BO, SCHNEIDER UWE: "Catalytic Use of Elemental Gallium for Carbon-Carbon Bond Formation", JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 138, 2016, pages 13119 - 13122, XP055814941 ^[1]

Category: X Claims: 1-38

Your reference: P0034121AU

Application number: 2020372186

D5: HOSHYARGAR FAEGHEH, CRAWFORD JESSICA, O'MULLANE ANTHONY P.: "Galvanic Replacement of the Liquid Metal Galinstan", JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 139, 2017, pages 1464 - 1471, XP055814942 ^[1]

Category: X Claims: 1-38

D6: CN 108795414 A (BEIJING DREAM INK TECH CO LTD) 13 November 2018 ^[1]

Category: X Claims: 1-32

D7: HOSHYARGAR FAEGHEH ET AL: "Generation of catalytically active materials from a liquid metal precursor", CHEMICAL COMMUNICATIONS, vol. 51, no. 74, 1 January 2015 (2015-01-01), UK, pages 14026 - 14029, XP093093148, ISSN: 1359-7345, DOI: 10.1039/C5CC05246G ^[2]

Category: X Claims: 1-38

^[1] Cited in the search/examination report of WO 2021/077164 A1

^[2] Cited in the search/examination report of EP 4049328 A4

Note that this report has cited non-patent literature document/s. Copies of non-patent literature document/s can be requested for a fee (see [Patent Regulations, schedule 7, fee item 233 and 234](#)) through [online services](#).

Please provide the citation details and associated patent application number with your request. Note that because of copyright restrictions we can only provide copies of hard copy books, journals and newspapers (see the Australian Patent Office Manual of Practice and Procedure at [part 5.6.4.6 Identifying and Raising Citations](#)). However, copies of any remaining documents should be readily obtainable from known electronic database sources.

Special categories of cited documents:

X: The claimed invention cannot be considered novel under [subsection 7\(1\)](#) in light of the document and/or cannot be considered to involve an inventive step under [subsection 7\(2\)](#) of the Act in light of the common general knowledge considered together with the document.

Novelty and inventive step

2 Note: D6 was viewed as a machine translation obtained via Google Patents.

The invention defined in claim 1 is not novel (and does not involve an inventive step) in light of any one of D1-D7.

D1-D6 are discussed in Box V of the IPRPI dated 26 April 2022. D7 is discussed at item 4 of the European Search Opinion for EP 4049328 dated 27 October 2023. While the objections regarding these documents were not made under Australian law, I agree with those reports and consider that they support a corresponding objection against Australian claim 1. Each of these documents discloses a liquid metal dispersed in a solvent, which is either used as a catalyst or is suitable as a catalyst and therefore anticipates claim 1.

With respect to appended claims 2-38, it is considered that none of the features contained therein make a patentable contribution over the teachings of any one of D1-D5 or D7. The subject matter of these claims is either disclosed by D1-D5 or D7, considered singularly, or is considered an obvious variation for the skilled addressee. For example, D1 discloses using the galinstan-ceria dispersion as a catalyst in converting carbon dioxide to solid carbon and gaseous oxygen (see Methods section), which anticipates claims 33 & 34.

With regard to D7, it is considered that none of the features defined in claims 2-32 make a patentable contribution over the teaching of this document. The subject matter of these claims is either disclosed by D6 or is considered an obvious variation for the skilled addressee. For example, D6 discloses preparation of the dispersions by ultrasonication in a HCl surfactant solution (see claims 13 and 15),

Your reference: P0034121AU

Application number: 2020372186

which anticipates claims 18, 19, 27 and 28.

END OF REPORT