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A61K 31/4525 (2006.01) *A61M 11/00* (2006.01)
A61K 36/8962 (2006.01)

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— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
16 July 2020 (16.07.2020)

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(54) Title: FORMULATIONS AND COMPOSITIONS FOR ORTHO- AND/OR RETRO-NASAL DELIVERY AND ASSOCIATED SYSTEMS, METHODS AND ARTICLES

(57) Abstract: A composition of food or therapeutic and other substances for administration as a cloud of droplets, the cloud comprising readily-soluble droplets having a median size range of approximately 3 microns to approximately 20 microns, or 5 microns to 10 microns, or 6 microns to 10 microns, for introduction to an animal via an ortho-nasal or retro-nasal route. Agonists or antagonists may include one or more of the following: sodium iodide, sodium chloride, magnesium chloride, capsaicin, piperine, linalool, ground cinnamon, a cannabinoid, pimento, onion, clove, thyme, ginger, menthol, or TRPV antagonists, and chocolate, Irish cream, caramel, lemon, lime, mango, raspberry, watermelon, blueberry, strawberry, mint, popcorn, meat, Resolvin D2 or nicotine. Devices for delivering compositions as an aerosol are described.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/049541

A. CLASSIFICATION OF SUBJECT MATTER

A61K 33/18(2006.01)i, A61K 33/14(2006.01)i, A61K 31/165(2006.01)i, A61K 31/4525(2006.01)i, A61K 36/8962(2006.01)i, A61K 9/00(2006.01)i, A61M 15/08(2006.01)i, A61M 15/00(2006.01)i, A61M 11/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K 33/18; A61L 9/03; A61M 11/00; A61M 15/00; A61P 25/00; A61P 29/00; B05B 17/06; C07D 401/12; C07D 417/12; A61K 33/14; A61K 31/165; A61K 31/4525; A61K 36/8962; A61K 9/00; A61M 15/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & keywords: nasal delivery, agonist, antagonist, TRPV, aerosol, olfactory receptors, taste receptors, vessel, dock, distinct delivery device

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006-122156 A2 (HYDRA BIOSCIENCES, INC.) 16 November 2006 claims 39, 50; and page 120	1-3,6-15
A		4,5,52-85
X	WO 2007-073505 A2 (HYDRA BIOSCIENCES, INC. et al.) 28 June 2007 claims 1, 97, 100; and page 97	1-3,6-15
X	WO 2018-048779 A1 (CHILDREN`S MEDICAL CENTER CORPORATION) 15 March 2018 claims 1, 2, 12, 33-35; and paragraph [094]	1-3,6-15
A	EP 1066850 A1 (SIEMENS-ELEMA AB) 10 January 2001 the whole document	1-15,52-85
A	US 9573154 B2 (AERODESIGNS, INC.) 21 February 2017 the whole document	1-15,52-85
A	US 8001963 B2 (GIROUX, M.) 23 August 2011 the whole document	1-15,52-85

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
05 June 2020 (05.06.2020)	**05 June 2020 (05.06.2020)**

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/049541

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GROBMAN, M. E. et al., `The TRPV1 receptor agonist capsaicin is an ineffective bronchoprovocant in an experimental model of feline asthma`, Journal of Feline Medicine and Surgery, Epub. 30 Octorber 2014, Vol.17, No.10, pp.915-918 the whole document	1-15,52-85
A	SMUTZER, G. et al., `Integrating TRPV1 Receptor Function with Capsaicin Psychophysics`, Advances in Pharmacological Sciences, 2016, Vol.2016, Article ID 1512457, pp.1-16 the whole document	1-15,52-85

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/049541

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 16-51
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 16-51 relate to a method comprising a step of direct medical procedure for the human body, and thus relate to a subject matter which this International Searching Authority is not required, under PCT Article 17(2)(a)(i) and Rule 39.1(iv), to search.

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required addtional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of any additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2019/049541

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International application No.

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