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[Continued on next page]

(54) Title: METHODS FOR PREPARING NANOFORMULATIONS AND SYSTEMS FOR NANO - DELIVERY USING FOCUSED ACOUSTICS

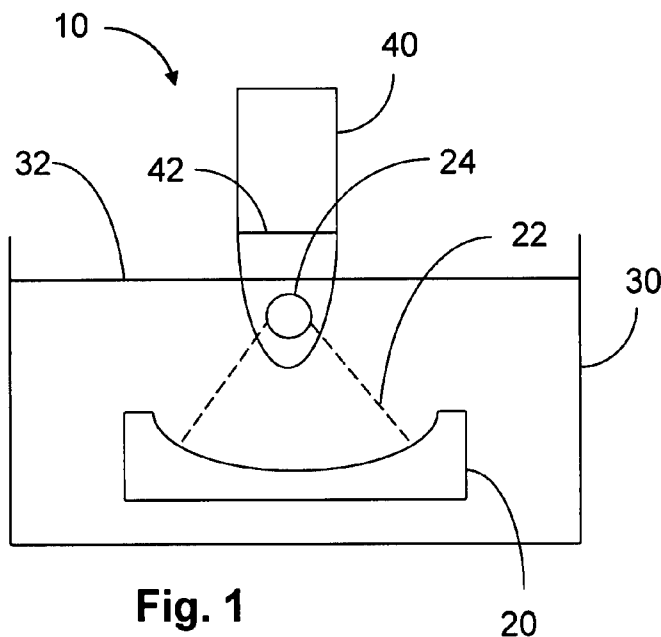


Fig. 1

(57) Abstract: Focused ultrasonic acoustic processing is used to prepare formulations particles ranging between approximately 10 nm and approximately 50 microns (e.g., between 1 micron and 20 microns), or between approximately 10 nm approximately 400 nm (e.g., between 10 nm and 100 nm). Formulations (e.g., nanoformulations) may include a suspension (e.g., nanosuspension), an emulsion (e.g., nanoemulsion) or another small particle system. Formulations may be used as delivery systems for therapeutic agents. A formulation may also include a suspension of micron or submicron sized particles dispersed within a solvent. Or, a formulation may include a bioactive agent and a carrier compound such as a surfactant that encapsulates the bioactive agent (e.g., liposome/micelle containing a pharmaceutical, polynucleotide, etc.). In some cases, the polydispersity index of the particle size distribution in a formulation is less than 0.1. Formulations may be suitably prepared using focused acoustic energy that results in a reduction of the average particle size of a mixture. Alternatively, suitable formulations may be prepared using focused acoustics in a manner that does not reduce the average particle size of the mixture.

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— *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))*

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. B01F11/02 B01J2/18 B01J19/10
 ADD.

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)
B01F B01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>US 6 719 449 B1 (LAUGHARN JR JAMES A [US] ET AL) 13 April 2004 (2004-04-13) cited in the application figures 1-9 claims 1,19 column 3, line 24 - line 29 column 18, line 47 - line 62 column 21, line 13 - line 28 page 48, line 20 - page 49, line 43 ----- -/- .</p>	<p>1-27 , 30-32 , 49-56</p>

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 10 November 2011	Date of mailing of the international search report 03/02/2012
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <p style="text-align: center;">Krasenbri nk, B</p>
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/001171

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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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:

see additional sheet

1. As all required additional 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 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. :

1-32 , 49-56

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

International application No

PCT/US2011/001171

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>US 6 948 843 B2 (LAUGHARN JAMES A [US] ET AL LAUGHARN JR JAMES A [US] ET AL) 27 September 2005 (2005-09-27) cited in the application figure 7 claims 1,11 column 2, line 50 - column 3, line 27 column 16, line 1 - line 8 column 18, line 32 - line 43 column 29, line 5 - line 20 column 36, line 64 - column 37, line 8 column 38, line 8 - line 24 column 38, line 39 - line 56</p> <p style="text-align: center;">-----</p>	<p>1-27, 30-32, 49-56</p>
X	<p>EP 1 925 359 A1 (COVARIS INC [US]) 28 May 2008 (2008-05-28) abstract figure 1 paragraphs [0001], [0004], [0005], [0006], [0008], [0014], [0016] - [0018], [0021], [0023], [0041] - [0044]</p> <p style="text-align: center;">-----</p>	<p>1-32, 49-56</p>

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/001171

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6719449	B1	13-04-2004	
		AT 381016 T	15-12-2007
		AU 1600000 A	15-05-2000
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		EP 1125121 A1	22-08-2001
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		US 2008050289 A1	28-02-2008
		WO 0025125 A1	04-05-2000

US 6948843	B2	27-09-2005	NONE

EP 1925359	A1	28-05-2008	NONE

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-32, 49-56

method and system for preparing a formulation wherein the second composition comprises a surfactant

2. claims: 33-48

method and system for preparing a formulation wherein the plurality of particles comprise a hydrophilic liquid material or a hydrophobic liquid material containing an active ingredient, and further comprising a carrier that suspends the particles, the carrier including a liquid having a hydrophilicity that is opposite that of the particles.
