

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
31 December 2008 (31.12.2008)

PCT

(10) International Publication Number  
WO 2009/003024 A3

- (51) International Patent Classification:  
B01D 3/40 (2006.01) A61K 31/616 (2006.01)  
C07C 53/02 (2006.01) B01F 7/26 (2006.01)
- (21) International Application Number:  
PCT/US2008/068164
- (22) International Filing Date: 25 June 2008 (25.06.2008)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/946,500 27 June 2007 (27.06.2007) US
- (71) Applicant (for all designated States except US): **H R D CORPORATION** [US/US]; 14549 Minetta, Houston, Texas 77035 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **HASSAN, Abbas** [US/US]; 14549 Minetta, Houston, Texas 77035 (US). **BAGHERZADEH, Ebrahim** [IR/US]; 14549 Minetta, Houston, Texas 77035 (US). **ANTHONY, Rayford, G.** [US/US]; 14549 Minetta, Houston, Texas 77035 (US). **BORSINGER, Gregory** [US/US]; 17 Pembroke Rd., Chatham, New Jersey 07928 (US). **HASSAN, Aziz** [US/US]; 14549 Minetta, Houston, Texas 77035 (US).

- (74) Agents: **WESTBY, Timothy, S.** et al.; Conley Rose, P.C., P.O. Box 3267, Houston, Texas 77253-3267 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

- Published:**
  - with international search report
  - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:  
19 February 2009

(54) Title: HIGH SHEAR PROCESS FOR ASPIRIN PRODUCTION

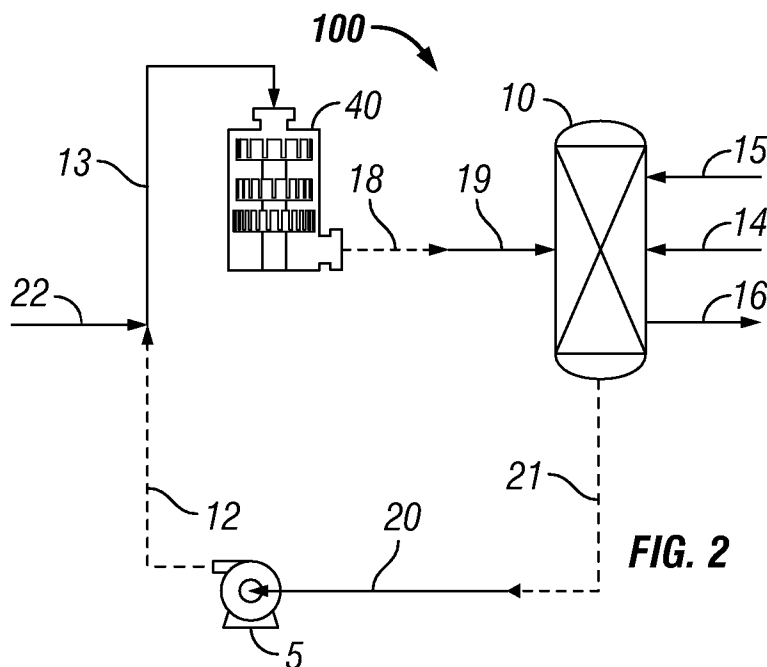


FIG. 2

(57) Abstract: Use of a high shear mechanical device in a process for production of acetyl salicylic acid, by contacting acetic anhydride with salicylic acid in a high shear device. The disclosed process makes possible a decrease in mass transfer limitations, thereby enhancing production of acetyl salicylic acid. A system for production of acetyl salicylic acid is also provided in which a reactor is configured to receive the output from a high shear device, which is configured to receive, via one or more inlets, acetic anhydride, and salicylic acid and generate a fine dispersion or emulsion of reactants.

WO 2009/003024 A3

**A. CLASSIFICATION OF SUBJECT MATTER***B01D 3/40(2006.01)i, C07C 53/02(2006.01)i, A61K 31/616(2006.01)i, B01F 7/26(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)

IPC 8 B01D 3/40, C07C 69/00, G03G 9/08, B01F 7/02

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 since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO internal), E-SPACENET

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2,987,539 A(W. C. STOESEER et al.) 6 JUNE 1961 See column 1, lines 10-13, lines 40-45, claim 1	1-20
Y	US 2004/191667 a1(HISASHI KUROKAWA et al.) 30 SEPTEMBER 2004 See abstract, fig. 1, paragraphs [0006], [0010], [0012], [0013]-[0015], [0034], [0074], [0075], [0084], [0087], [0089] and [0093]	1-20
Y	US 6,278,014 B1(ERLINDA HANDAL-VEGA et al.) 21 AUGUST 2001 See column 2, lines 1-55, claim 1	1-20
Y	US 2003/43690 A1(RICHARD A. HOLL) 6 MARCH 2003 See abstract, fig. 1, paragraphs [0001], [0025], [0034] and [0036]	1-20

 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

"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 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

19 DECEMBER 2008 (19.12.2008)

Date of mailing of the international search report

**22 DECEMBER 2008 (22.12.2008)**

Name and mailing address of the ISA/KR

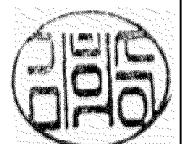
Korean Intellectual Property Office  
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu,  
Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KIM, Hee Seung

Telephone No. 82-42-481-8656



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2008/068164**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2,987,539 A	06. 06. 1961	NONE	
US 2004/191667 A1	30. 09. 2004	JP 2004-302310 A	28. 10. 2004
US 6,278,04 B1	21. 08. 2001	WO 99/31039 A1	24. 06. 1999
US 2003/43690 A1	06. 03. 2003	AT 317292 T	15. 02. 2006
		AU 2002-247197 B2	24. 09. 2002
		BR 0208180 A	16. 08. 2005
		CA 2440871 A1	19. 09. 2002
		CN 1503690 A	09. 06. 2004
		DE 60209110 D1	20. 04. 2006
		DK 1385609 T3	19. 06. 2006
		EA 5187 B1	30. 12. 2004
		EP 1385609 A1	04. 02. 2004
		ES 2258617 T3	01. 09. 2006
		HK 1064629 A1	11. 08. 2006
		IL 157789 D0	28. 03. 2004
		JP 2004-538125 A	24. 12. 2004
		KR 10-2004-0020887 A	09. 03. 2004
		WO 02/72251 A1	19. 09. 2002
		ZA 200307545 A	08. 09. 2004