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(54) Title: PREPARATION OF DRY POWDER FORMULATIONS COMPRISING TIOTROPIUM

(57) Abstract: The present invention relates to the process for the preparation of pharmaceutical formulations in dry powder form comprising tiotropium or pharmaceutically acceptable derivatives thereof in order to be used in symptomatic and/or prophylactic treatment of respiratory tract diseases, particularly asthma and COPD.

# INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. A61K9/14      A61K9/16      A61K31/46 ADD.		
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<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) A61K		
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<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 172 190 A1 (LICONSA LABORATORIOS SA [ES]) 7 April 2010 (2010-04-07) paragraphs [0022], [0024], [0025], [0028], [0032], [0033], [0034], [0040], [0044], [0064] - [0069], [0081] - [0083]; examples 8-11; table 3 -----	1-22
X	WO 2011/093820 A2 (BILGIC MAHMUT [TR]) 4 August 2011 (2011-08-04) page 6, last paragraph - page 7, line 5 page 11 - page 14; examples 1-38 -----	1-22
X	WO 2011/093819 A2 (BILGIC MAHMUT [TR]) 4 August 2011 (2011-08-04) page 6, lines 21-30 page 11 - page 14; examples 1-38 -----	1-22
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/136919 A1 (HARTIG MAREKE [DE] ET AL) 15 July 2004 (2004-07-15) claims 1-4; examples 1-20 -----	1-22
X	WO 2011/152804 A2 (BILGIC MAHMUT [TR]) 8 December 2011 (2011-12-08) page 1, line 23 - page 3, line 9 page 4, line 1 - page 6, line 19 claims 1-15; examples 1-3 -----	1-22

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2172190	A1	07-04-2010	AR 073528 A1 10-11-2010
			AU 2009299801 A1 08-04-2010
			CA 2737399 A1 08-04-2010
			CN 102170861 A 31-08-2011
			CO 6361899 A2 20-01-2012
			DO P2011000091 A 30-04-2011
			EC SP11010925 A 29-07-2011
			EP 2172190 A1 07-04-2010
			EP 2349204 A1 03-08-2011
			JP 2012504580 A 23-02-2012
			KR 20110081265 A 13-07-2011
			MA 34560 B1 02-10-2013
			NZ 591923 A 24-02-2012
			PE 08502011 A1 25-11-2011
			RU 2011117256 A 10-11-2012
			SV 2011003852 A 12-04-2011
			TW 201018468 A 16-05-2010
			US 2011311618 A1 22-12-2011
			UY 32160 A 30-04-2010
			WO 2010037845 A1 08-04-2010
-----			
WO 2011093820	A2	04-08-2011	TR 201000622 A2 22-08-2011
			WO 2011093820 A2 04-08-2011
-----			
WO 2011093819	A2	04-08-2011	TR 201000623 A2 22-08-2011
			WO 2011093819 A2 04-08-2011
-----			
US 2004136919	A1	15-07-2004	US 2004136919 A1 15-07-2004
			US 2009311314 A1 17-12-2009
-----			
WO 2011152804	A2	08-12-2011	EP 2575786 A2 10-04-2013
			US 2013202778 A1 08-08-2013
			WO 2011152804 A2 08-12-2011
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