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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

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(54) **Title**: IMPROVEMENT OF MUSCULOSKELETAL HEALTH BY NUTRITION AND EXERCISE

(57) **Abstract**: The present invention provides a treatment or program comprising the administration of a nutritional composition and physical exercise, in particular in the frame of a regular exercise program, for ensuring healthy growth and improving the quality of life of children, for example. The invention addresses in particular children of compromised health and children with suboptimal nutrition. The treatment of the invention is suitable to improving the musculoskeletal health in a subject. In particular, the treatment of the invention is suitable to increase muscle strength, muscle power, muscle endurance, bone health, bone strength, and bone density.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A23L1/29 A23L1/30 A23L1/302 A23L1/305 A63F13/00
ADD. A61P1/00

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)
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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 practicable, search terms used)
EPO-Internal, BIOSIS, FSTA, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2011/031602 A1 (NESTEC SA [CH]; BOLSTER DOUGLAD RICHARD [US]; ROUGHEAD ZAMZAM KABIRY [] 17 March 2011 (2011-03-17)	1
Y	paragraphs [0004] - [0018], [0033], [0040] - [0041], [0045] - [0049], [0067] - [0069], [0088] - [0090]	2-16
Y	MAURO ET AL: "Evaluation of densitometric bone-muscle relationships in Crohn's disease", BONE, PERGAMON PRESS., OXFORD, GB, vol. 40, no. 6, 19 May 2007 (2007-05-19), pages 1610-1614, XP022085708, ISSN: 8756-3282, DOI: 10.1016/J.BONE.2007.02.026 the whole document	2-16

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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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.
Y	MUELLER U ET AL: "336 Physical exercise in combination with dietary advice increases muscle mass and the power of endurance in patients with Cystic fibrosis (CF)", JOURNAL OF CYSTIC FIBROSIS, ELSEVIER, NL, vol. 4, 1 January 2005 (2005-01-01), page S90, XP004983704, ISSN: 1569-1993 abstract	2-16
Y	FANELLI ADRIANA ET AL: "Exercise training on disease control and quality of life in asthmatic children", MEDICINE & SCIENCE IN SPORTS & EXERCISE, vol. 39, no. 9, September 2007 (2007-09), pages 1474-1480, XP009151645, ISSN: 0195-9131, DOI: 10.1249/mss.0bo13e180d099ad abstract the whole document	2-16
Y	BONSIGNORE MARIA R ET AL: "Effects of exercise training and montelukast in children with mild asthma", 20080301, vol. 40, no. 3, 1 March 2008 (2008-03-01), pages 405-412, XP008133131, DOI: 10.1249/MSS.0B013E31815D9670 abstract pages 405-406	2-16
X	US 2009/035437 A1 (BOVETTO LIONEL JEAN RENE [FR] ET AL) 5 February 2009 (2009-02-05) cited in the application paragraphs [0065], [0064] example 13	1
A	WO 2009/095240 A1 (FRIESLAND BRANDS BV [NL]; SCHAAFSMA ANNE [NL]; GLAS CORNELIS [NL]; VAN) 6 August 2009 (2009-08-06) page 5, line 6 - page 6, line 25 page 7, lines 10-24 page 8, lines 12-17 page 9, lines 22-32 page 11, lines 12-17 examples 1,2,5,15,18 pages 23-24 claims 1,5,7,24,27 figure 2	1-16

-/--

1

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KIRKHAM P ET AL: "Oxidative stress in asthma and COPD: Antioxidants as a therapeutic strategy", PHARMACOLOGY AND THERAPEUTICS, ELSEVIER, GB, vol. 111, no. 2, 1 August 2006 (2006-08-01), pages 476-494, XP025038477, ISSN: 0163-7258, DOI: 10.1016/J.PHARMTHERA.2005.10.015 [retrieved on 2006-08-01] pages 485-488 pages 480-483	2-4,6, 8-11, 13-16
A	US 2004/180708 A1 (SOUTHARD BARBARA HELEN [US] ET AL) 16 September 2004 (2004-09-16) the whole document	1-16
A	KEGELMEYER D ET AL: "Poster 4: The Effect of Video Game-Based Exercise on Dynamic Balance and Mobility in Individuals with Huntington's Disease", NEUROTHERAPEUTICS, ELSEVIER INC, US, vol. 7, no. 1, 1 January 2010 (2010-01-01) , page 139, XP026824413, ISSN: 1933-7213 [retrieved on 2009-12-31] abstract	1-16
A	FOODY J ET AL: "A Prototype Sourceless Kinematic-Feedback Based Video Game for Movement Based Exercise", CONFERENCE PROCEEDINGS. ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (IEEE CAT. NO. 06CH37748); 30 AUG.-3 SEPT. 2006; NEW YORK, NY, USA, IEEE, PISCATAWAY, NJ, USA, 30 August 2006 (2006-08-30), pages 5366-5369, XP031390662, ISBN: 978-1-4244-0032-4 the whole document	1-16

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2013/056645

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011031602 A1	17-03-2011	AU 2010292439 A1	12-04-2012
		AU 2010292440 A1	12-04-2012
		CA 2773940 A1	17-03-2011
		CA 2773957 A1	17-03-2011
		CN 102596190 A	18-07-2012
		CN 102781258 A	14-11-2012
		EP 2477510 A1	25-07-2012
		EP 2477618 A2	25-07-2012
		JP 2013504571 A	07-02-2013
		JP 2013504572 A	07-02-2013
		SG 179064 A1	27-04-2012
		SG 179065 A1	27-04-2012
		US 2012208893 A1	16-08-2012
		US 2013052274 A1	28-02-2013
		WO 2011031601 A2	17-03-2011
		WO 2011031602 A1	17-03-2011
US 2009035437 A1	05-02-2009	AR 060163 A1	28-05-2008
		AT 524073 T	15-09-2011
		AU 2007231336 A1	04-10-2007
		AU 2007231346 A1	04-10-2007
		CA 2640684 A1	04-10-2007
		CA 2643651 A1	04-10-2007
		CN 101410020 A	15-04-2009
		CN 101410025 A	15-04-2009
		EP 1839492 A1	03-10-2007
		EP 1998626 A2	10-12-2008
		EP 2001306 A2	17-12-2008
		ES 2373400 T3	03-02-2012
		JP 2009531043 A	03-09-2009
		NZ 571141 A	25-11-2011
		PL 1839492 T3	29-02-2012
		RU 2008142396 A	10-05-2010
		RU 2008142397 A	10-05-2010
		US 2009035437 A1	05-02-2009
		US 2013171318 A1	04-07-2013
		WO 2007110411 A2	04-10-2007
		WO 2007110421 A2	04-10-2007
		ZA 200809154 A	27-01-2010
WO 2009095240 A1	06-08-2009	CN 101969792 A	09-02-2011
		EA 201070893 A1	28-02-2011
		EP 2247199 A1	10-11-2010
		NL 1034964 C2	30-07-2009
		WO 2009095240 A1	06-08-2009
US 2004180708 A1	16-09-2004	NONE	