



Carbon Dioxide Applications

Who is behind the science?

April 2017

MILAN, ITALY

GIOVANNI CAPPELLO, Partner & Founder

Mr. Cappello received in 1987 his Bachelor degree in Mechanical Engineering at the Polytechnic di Milano, and his MBA in 1992 at the Sda Boconi, Milano. Mr. Cappello started his career as a designer of cogeneration plants using gas turbine at NOY VALLESINA ENG. SPA and TEXTILE PRODUKTE SPA in Italy. Then moved to the GRUPPO RADICI SPA, Italy, managing feasibility studies and negotiations for setting up Joint Ventures in India, Rumania, Belorussia and China. Mr. Cappello managed the companies CRYLOR in Brazil, COMACSA in Argentina and XIAMEN LUNI MASTER BATCH in China, all of them large synthetic polymers and fibers manufacturers. In 1998 he developed and managed a 45,000 has agricultural irrigation project in Argentina as president of Ser Beef SA producing cereals plus a feed lot of 50,000 cattle and a slaughter house for 15,000 heads/month. Mr. Cappello served as a professor at the Universidad de Piura. Since 2002, Mr. Cappello has been totally dedicated, along with Mr. Ross, to the research and development to reform organic materials under vacuum condition to separate and clean the resulting syngas for energy and hydrogen production. He has different patent applications and also patents granted in the gasification field. Since 2013 he is deeply involved in finding solutions for the global warming and the decarbonization of the energy sector using his know how in hydrogen production from biomass and CO₂ capture from the syngas. With Mr. Ross Morrey, they own a patented intellectual property for safely transporting and storing liquid CO₂ using a glass-ceramic complex as well as a calcination process to produce H₂ and affordable negative CO₂ emissions.



DENNIS ROSS MORREY, Partner & Founder

Mr. Ross Morrey received in 1980 his Bachelor degree in Engineering Sciences at the Universidad de Piura, Peru, and studied an additional two years of Industrial Engineering. In 1981, Mr. Ross Morrey developed, patented, manufactured and commercialized a programmable logic controller used for telecommunications. For several years, he worked as a private consultant for large industrial companies. Mr. Ross Morrey has many years of experience in research and development in biochemistry and energy industry. In 2001, as Principal Scientist in Naturel Corp., he patented a new process to extract active principles from plants; he also worked on enzymatic hydrolysis of cellulose for the production of ethanol. Mr. Ross Morrey has many environmental engineering and scientific assessments with expertise combining research and industrial know-how with a functional knowledge of environmental impact and risk assessment and management. Since 2002, Mr. Ross Morrey has been totally dedicated to the research and development to reform organic materials under vacuum conditions to increase the ratio hydrogen to carbon of the final products and to develop the downstream infrastructure with a carbon capture and storage pre/post combustion. With Mr. Cappello, they own a patented intellectual property for safely transporting and storing liquid CO₂ using a glass-ceramic complex as well as a calcination process to produce H₂ and affordable negative CO₂ emissions.





(12) **United States Patent**
Cappello

(10) **Patent No.:** **US 8,695,323 B2**
(45) **Date of Patent:** **Apr. 15, 2014**

(54) **PLANT FOR THE GASIFICATION OF BIOMASS**

(75) Inventor: **Giovanni Cappello, Lecco (IT)**

(73) Assignee: **A.G.T. SRL (IT)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1243 days.

(21) Appl. No.: **12/526,122**

(22) PCT Filed: **Feb. 6, 2008**

(86) PCT No.: **PCT/IT2008/000073**

§ 371 (c)(1),
(2), (4) Date: **Sep. 19, 2009**

(87) PCT Pub. No.: **WO2008/096387**

PCT Pub. Date: **Aug. 14, 2008**

(65) **Prior Publication Data**

US 2010/0000224 A1 Jan. 7, 2010

(30) **Foreign Application Priority Data**

Feb. 7, 2007 (WO) PCT/IT2007/000078

(51) **Int. Cl.**
F02C 3/26 (2006.01)

(52) **U.S. Cl.**
USPC **60/39,464; 60/39,465; 60/39,461;**
60/39,463; 60/39,462; 60/39,47; 60/780;
60/781; 60/39,12

(58) **Field of Classification Search**
USPC **60/39,464, 39,465, 39,461-39,463,**
60/39,47, 781, 780, 39,12
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,702,039 A	11/1972	Stokey et al.	
4,052,173 A	10/1977	Schulz	
4,154,582 A	5/1979	Woodmansee	
4,291,636 A *	9/1981	Bergsten et al.	110/346
5,375,908 A *	12/1994	Daman	60/781

(Continued)

FOREIGN PATENT DOCUMENTS

CN	2680671 Y	2/2005
DE	20000661 U1	4/2000

(Continued)

OTHER PUBLICATIONS

"PCT Partial International Search Report, from which the instant application is based," 5 pgs.

(Continued)

Primary Examiner — Gerald I. Sung

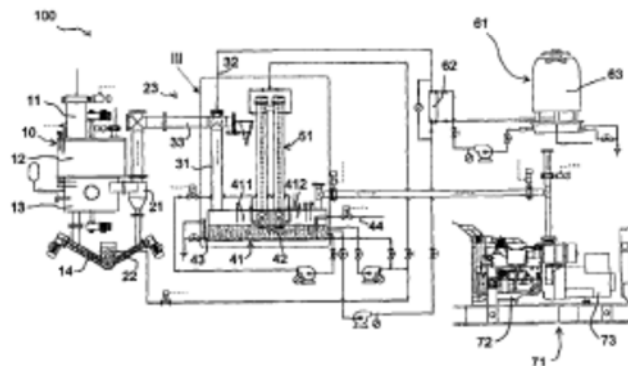
Assistant Examiner — Craig Kim

(74) *Attorney, Agent, or Firm* — Fredrickson & Byron, P.A.

(57) **ABSTRACT**

A plant (100) for the gasification of biomass comprises a gasifier (10) and an apparatus (23) for the filtration of the gas. The apparatus comprises a scrubber (31), a tank (41), and a wet electrostatic precipitator (51). The scrubber is in fluid communication with the gasifier and with the tank, and is adapted for the injection of a washing liquid in the gas flow. The tank comprises a bottom area for collecting the liquid and a top area for holding the gas. The wet electrostatic precipitator is in fluid communication with the top area of the tank. In some examples, a gasifier comprises a gasification reactor (12), a grate (125) for the support of the biomass in the reactor (12) and a plug (126). The plug is vertically movable so as to close and/or open the middle part of the grate.

30 Claims, 14 Drawing Sheets





US006962725B2

(12) **United States Patent**
McFadden, Sr. et al.

(10) **Patent No.:** **US 6,962,725 B2**
(45) **Date of Patent:** **Nov. 8, 2005**

(54) **LOW TEMPERATURE PROCESS FOR EXTRACTING PRINCIPAL COMPONENTS FROM PLANTS OR PLANT MATERIALS AND PLANT EXTRACTS PRODUCED THEREBY**

(75) Inventors: **Patrick G. McFadden, Sr.**, Hackettstown, NJ (US); **Dennis A. Ross-Morrey**, Hackettstown, NJ (US)

(73) Assignee: **Naturel Corporation, LLC**, Hackettstown, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 334 days.

(21) Appl. No.: **10/164,057**

(22) Filed: **Jun. 5, 2002**

(65) **Prior Publication Data**
 US 2002/0187245 A1 Dec. 12, 2002

Related U.S. Application Data
(60) Provisional application No. 60/296,220, filed on Jun. 6, 2001.

(51) **Int. Cl.**⁷ **A23L 1/222**

(52) **U.S. Cl.** **426/651; 426/425; 426/428; 426/429; 426/534; 426/615; 426/650**

(58) **Field of Search** 426/425, 428, 426/429, 430, 534, 615, 629, 638, 650, 651

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,301,694 A * 4/1994 Raymond et al. 131/297
 6,013,304 A 1/2000 Todd
 6,063,381 A 5/2000 Staggs
 6,190,685 B1 2/2001 Kanjo
 6,383,526 B1 5/2002 Andrews et al.

OTHER PUBLICATIONS

Rombauer et al., *Joy of Cooking*, 1975, The Bobbs-Merrill Company, Inc., Indianapolis/New York, p. 577.*

* cited by examiner

Primary Examiner—Leslie Wong

(74) *Attorney, Agent, or Firm*—Holland & Bonzagni, P.C.; Mary R. Bonzagni, Esq.

(57) **ABSTRACT**

A low temperature process for extracting principal components from plants or plant materials and plant extracts produced by such a low temperature process, are provided. The inventive low temperature process improves the yield and quality of volatile and non-volatile components extracted from plants or plant materials.

17 Claims, 1 Drawing Sheet

PATENT COMMERCIAL DEPLOYMENT

Feedstock : Agricultural Waste (Biomass)
Place : Cordova, Argentina – Mar 2017







