US008632830B2

(12) **United States Patent**
Obach et al.

(10) **Patent No.: US 8,632,830 B2**
(45) **Date of Patent: Jan. 21, 2014**

(54) **FISH FODDER FOR FRESHWATER FISH AND USE OF SUCH FODDER**

(75) Inventors: **Alex Obach**, Stavanger (NO); **Laura Gil Martens**, Sola (NO); **Wolfgang M. Koppe**, Stavanger (NO); **Vibeke Vikeså**, Sandnes (NO)

(73) Assignee: **Trouw International B.V.**, JN Boxmeer (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1465 days.

(21) Appl. No.: **10/571,965**

(22) PCT Filed: **Sep. 2, 2004**

(86) PCT No.: **PCT/NO2004/000257**

§ 371 (c)(1),
(2), (4) Date: **Apr. 13, 2006**

(87) PCT Pub. No.: **WO2005/025324**

PCT Pub. Date: **Mar. 24, 2005**

(65) **Prior Publication Data**

US 2006/0233916 A1 Oct. 19, 2006

(30) **Foreign Application Priority Data**

Sep. 15, 2003 (NO) 20034107

(51) **Int. Cl.**
A23K 1/16 (2006.01)
A23K 1/18 (2006.01)

(52) **U.S. Cl.**
USPC **426/74**; 426/805

(58) **Field of Classification Search**
USPC 426/74, 805
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,222,222	A	11/1940	Dennis, Jr.	
3,615,653	A	10/1971	Fults	
3,627,885	A	12/1971	Rondelet	
3,733,204	A *	5/1973	Campbell	426/2
3,889,007	A	6/1975	Gunter et al.	
3,892,866	A	7/1975	Kanemitsu	
3,903,275	A	9/1975	Streiff	
3,903,304	A	9/1975	Groninger, Jr. et al.	
3,906,112	A	9/1975	Anderson	
3,916,832	A	11/1975	Sweeney	
4,053,646	A	10/1977	Wright	
4,060,645	A	11/1977	Risler	
4,061,755	A	12/1977	McDougald	
4,110,467	A	8/1978	Sano	
4,141,994	A	2/1979	Aneja	
4,154,864	A	5/1979	Risler	
RE30,038	E	6/1979	Sweeney	
4,160,041	A	7/1979	Schroeder	
4,169,162	A	9/1979	Appleman	
4,171,681	A	10/1979	Berger	
4,260,637	A	4/1981	Rispoli	
4,262,633	A	4/1981	Taboga	
4,279,932	A	7/1981	Koshida	
4,284,652	A	8/1981	Christensen	
4,287,220	A	9/1981	Pappas	
4,297,973	A	11/1981	Knowles	
4,312,296	A	1/1982	Stelleman	
4,351,269	A	9/1982	Rines	
4,364,928	A	12/1982	Martel	
4,372,252	A	2/1983	Lowry, Jr.	
4,376,129	A	3/1983	Piukovich	
4,379,437	A	4/1983	Knowles	
4,379,844	A	4/1983	Young	
4,385,589	A	5/1983	Knowles	
4,393,087	A	7/1983	Sullins	
4,396,634	A	8/1983	Shenouda	
4,405,377	A	9/1983	Neuzil	
4,409,107	A	10/1983	Busch	
4,422,408	A	12/1983	Pohlhausen	
4,436,759	A	3/1984	Trilling	
4,447,254	A	5/1984	Hughes	
4,447,530	A	5/1984	Young	
4,454,161	A	6/1984	Okada	

(Continued)

FOREIGN PATENT DOCUMENTS

AU	596359	11/1987
CN	1123617	6/1996

(Continued)

OTHER PUBLICATIONS

"Nutrient Requirements of Fish", National Research Council, pp. 64-66, 1993.*
"Nutrient Requirements of Fish", National Research Council, 1993, pp. 64-66.*
"Nutrient Requirements of Fish", National Research Council, 1993, pp. 16-32.*
Furuichi et al. Journal of the Faculty of Agriculture—Kyushu University, v. 42(1-2) p. 77-85, 1997.*
Baeverfjord et al., "Development and detection . . . ", Aquacult. Nutr., s. 1-11, 1998.
El-Mowafi & Maage, "Magnesium requirement of . . . ", Aquacult. Nutr. 4, s 31-38, 1998.

(Continued)

Primary Examiner — Chhaya Sayala
(74) *Attorney, Agent, or Firm* — Vidas, Arrett & Steinkraus, P.A.

(57) **ABSTRACT**

A rearing fodder of extruded fodder type, comprising proteins, fats and carbohydrates, for freshwater fish, wherein the fish is larger than 2 grams, and wherein the freshwater has a content of CO_2 being above 5 milligrams/liter, wherein the fodder has an increased content of at least one of the minerals: phosphate (P), potassium (K), calcium (Ca), sodium (Na) and magnesium (Mg) beyond what exists naturally in the used protein raw materials, fat raw materials and carbohydrate raw materials, wherein the collective amount of minerals in the extruded fodder is at least 10%, on a dry substance basis, of the total weight of the fodder, and wherein one or more of the minerals phosphate (P), potassium (K), calcium (Ca), sodium (Na) and magnesium (Mg) is/are added beyond what exist in the used protein raw materials, fat raw materials and carbohydrate raw materials.

10 Claims, No Drawings