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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
A23L 2/00, 1/302, 1/304, 1/305

A1

(11) International Publication Number: **WO 95/28854**

(43) International Publication Date: 2 November 1995 (02.11.95)

(21) International Application Number: PCT/US95/04957

(22) International Filing Date: 20 April 1995 (20.04.95)

(30) Priority Data:
08/230,328 20 April 1994 (20.04.94) US

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(81) Designated States: AU, BB, BG, BR, CA, FI, HU, JP, KP, KR, LK, MG, MN, MW, NO, PL, RO, RU, SD, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: DRINK COMPOSITION FOR PET ANIMALS

(57) Abstract

A drink composition for pet animals, such as cats and dogs, is formed primarily of purified water. Partly optional additives include up to 15 % sugar (dextrose, fructose, sucrose, long chain polysaccharides, and mixtures thereof); up to 5 % natural or artificial flavors; up to 15 % vitamin supplement, amino acid supplement, electrolyte and mineral supplement; up to 1 % preservatives (e.g. sodium benzoate or potassium sorbate); and a tartness and palatability enhancer for adjusting a pH of the drink composition to below 5.5 and particularly to about 4. The acidic additive is preferably sodium acid pyrophosphate, phosphoric acid or citric acid.

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DRINK COMPOSITION FOR PET ANIMALS

Field of the Invention:

The invention relates to animal nutrition in general and to liquid drink compositions for pet animals such as cats and dogs.

Background of the Invention:

Water is the most important nutrient of all nutrients. Historically, water provided to pet animals, such as dogs and cats, has generally been made available to them in the form of tap water or from an outside well. Currently, the quality of tap water may be improved by the addition of chlorine or fluoride. Well water is usually only purified via sand filtration. The overall molecular quality and taste of water varies from locale to locale depending on the purity of the original water source, materials and age of the water conduit lines, and degree of bacterial and chemical contamination throughout the water storage and piping systems. Poor quality drinking water, contaminated with environmental and industrial pollutants, can directly lead to health problems such as dehydration, cancer, heart disease, skin disease and kidney abnormalities.

The availability of purified and/or fortified drinking water for pet animals will enable the animals to drink water free of industrial and environmental pollutants. The decrease in exposure to procarcinogenic compounds will serve to increase the quality of health in pet animals. The decrease in exposure to poor tasting water will result in a greater water intake, which is known to improve health, especially in cats and dogs confined indoors. The amount of water intake varies with the environment in which the animal is maintained. An active sporting, working, or show dog will have a greater water need than a sedentary dog kept in the shade.

Similarly, cats kept outdoors or cats that perform in stressful show competitions may have increased water consumption.

The type of solid food fed to animals influences their water intake. Animals fed dry solid food receive little water in their food and thus have a greater drinking water intake than animals fed canned moist or semimoist pet food. Eighty-seven percent of all pet owners feed their animals dry food. Therefore, a large majority of all cats and dogs depend on drinking water for their water requirements.

A nutritional supplement for cats and dogs has been heretofore known from U.S. Patent No. 5,017,389 to Green. The nutritional drink composition described therein provides a number of components for immediate energy and body function improvement. The drink composition is particularly adjusted to a pH of 7, thus suggesting use of the composition for veterinary purposes. Such neutral solutions do not provide for ready palatability to the animals and the drink cannot function as a replacement or water substitute. The product according to the German patent recommends, for example, a daily dosage of 4 ounces for a pet weighing 27-45 kg.

Summary of the Invention:

It is accordingly an object of the invention to provide a drink composition for pet animals, which overcomes the hereinafore-mentioned disadvantages of water from municipal sources and the heretofore-known products of this general type and which provides a healthy, nutritional drink, in which the components can be easily adjusted to specific needs and which is palatable to the animals.

The main object, therefore, is to provide a source of purified drinking water for pet animals that is consistent in purity, odor and taste that pet owners can provide to their

pets as a substitute for and independently of their proximity to purified water.

In addition to improving the purity of water, this invention also provides for fortifying the water with healthy nutrients to include vitamins, amino acids, minerals/electrolytes and carbohydrates. Animals foods are formulated with minimum required daily amounts of ingredients. As a substitute for water, the drink according to the invention, fortified with vitamins, amino acids, carbohydrates and minerals will add to the total intake of such ingredients and serve to optimize the health of pet animals that have previously been maintained on minimum acceptable amounts of these nutrients. An object of this invention is to optimize the health of healthy to moderately healthy pet animals.

With the foregoing and other objects in view there is provided, in accordance with the invention, a drink composition for pet animals, comprising, in percent by weight:

80 - 99.9% water, purified by filtering and/or by reverse osmosis;

0.0 - 15% sugar, such as dextrose, fructose, sucrose, polysaccharides, and mixtures;

0.0 - 5% natural or artificial flavor and any mixtures thereof;

0.0 - 15% vitamin supplement, amino acid supplement, electrolyte and mineral supplement and any mixtures thereof;

0.0 - 1% preservatives, such as sodium benzoate and potassium sorbate;

and a tartness and palatability enhancer for adjusting a pH of the drink composition to below 5.5, preferably below 5 and, more particularly to about 4.

The low pH value ensures long shelf life of the bottled liquid drink, it makes the drink compatible with the animal's chemical system, and it ensures that the animal will like the drink.

The drink composition according to the invention has three major components, an olfactory component (ie., smell), a palatability component (ie., taste), and a health component (ie., pure and/or fortified water). Flavors, both natural and synthetic, may be used to promote the olfactory component of the invention. Beef, fish, chicken, turkey, liver and cat nip are flavors that may be used as olfactory and/or palatability enhancers. Other flavors, both natural and synthetic, may used to promote the palatability of the invention. Dextrose (D-glucose), fructose and mixed long chain polysaccharides are the carbohydrate palatability enhancers. Sodium pyrophosphate, sodium acid pyrophosphate, sodium tripolyphosphate, tetrasodium pyrophosphate, sodium polyphosphate, sodium tripolyphosphate, phosphoric acid, citric acid, and potassium citrate are noncarbohydrate palatability enhancers that may be in the drinks.

Vitamins are major health components of the liquid drinks. Vitamins in the liquid drinks may include both water soluble and water dispersible vitamins. The antioxidant vitamins C, E, A and alpha-tocopherol, as well as vitamin B_{12}, vitamin D_3, folic acid, D-biotin, cyanocobalamin, niacinamide (B_3), thiamin, riboflavin (B_2), pyridoxin (B_6), menadione (K_3), beta-carotene, calciumpantothenate, choline, and inositol may provide added nutrients to the liquid pet drinks. The concentration of the vitamins may be adjusted to deliver between 2 % to 200 % of the recommended daily requirements. The dog drink may be formulated with the necessary daily

vitamin requirements for a 14 kg dog in 500 milliliters. The cat drink may be formulated with the necessary daily vitamin requirements for a 3 kg cat in 125 milliliters.

The drink of the invention may include mineral and electrolyte supplements. Zinc, iron, calcium, manganese, copper, iodine, sodium, and potassium may be added to the liquid drinks as mineral and electrolyte supplements. Additionally, the invention may include amino acid supplements. Alanine, arginine, aspartic acid, asparagine, cysteine, glutamic acid, glycine, glutamine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, taurine, threonine, tryptophan, tyrosine, and valine are amino acids that may be added to the invention.

The drink of the invention may include potassium sorbate and sodium benzoate as preservatives, and may also use low levels of carbon dioxide for improving shelf life and in limiting biological growth.

Other features which are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as embodied in a drink composition for pet animals, it is nevertheless not intended to be limited to the examples, since various modifications and changes may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

The specific compositions of the invention, however, together with additional objects and advantages thereof will be best understood from the following description of the specific examples:

Example 1 - Dog Drink:

Five % by volume sweetener (mixture of approximately 52 % dextrose, 42 % fructose, 6 % polysaccharides), 0.001 % by volume flavor (beef, fish or chicken), one milliliter of a vitamin, mineral, and amino acid mixture suspended in 1 % sodium acid pyrophosphate (that contained ascorbic acid, biotin, niacinamide, pantothenic acid, pyridoxine riboflavin, zinc, and leucine), 0.005 % by weight sodium benzoate as a preservative and 0.005 % by weight potassium sorbate as a preservative were added to 950 milliliters of purified noncarbonated water and the solution was mixed by agitation. The pH of the solution was adjusted to 5.0 with 5 % sodium acid pyrophosphate. The volume of the solution was brought to 1 liter by the addition of purified water.

Example 2 - Dog Drink

Five % by volume sweetener (mixture of approximately 52 % dextrose, 42 % fructose, 6 % polysaccharides), 0.001 % by volume flavor (beef, fish or chicken), two milliliters of a vitamin, mineral, and amino acid mixture suspended in 1 % sodium acid pyrophosphate (that contained vitamin E, vitamin A, alpha-tocopherol, ascorbic acid (C), vitamin B_{12}, vitamin D_3, folic acid, d-biotin, cyanocobalamin, niacinamide (B_3), thiamin, riboflavin (B_2), pyridoxin (B_6), menadione (K_3), beta-carotene, calcium pantothenate, choline, inositol, zinc, iron, calcium, manganese, copper, iodine, sodium, potassium, alanine, arginine, aspartic acid, asparagine, cysteine, glutamic acid, glycine, glutamine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, taurine, threonine, tryptophan, tyrosine, and valine), 0.005 % by weight sodium benzoate as a preservative and 0.005 % by weight potassium sorbate as a preservative were added to 950 milliliters of purified noncarbonated water and the solution was mixed by agitation. The pH of the solution was adjusted to 5.0 with 5 % sodium acid pyrophosphate. The volume of the solution was brought to 1 liter by the addition of purified water.

Example 3 - Cat Drink:

One milliliter of vitamin, mineral, and amino acid mixture suspended in 1 % sodium acid pyrophosphate (that contained ascorbic acid, biotin, niacinamide, pantothenic acid, pyridoxine riboflavin, zinc, leucine and taurine), 0.001 % by volume flavor (fish or chicken), 0.001 % sodium acid pyrophosphate, 0.001 % by weight citric acid, 0.0001 % by weight dextrose, 0.005 % by weight sodium benzoate as a preservative and 0.005 % by weight potassium sorbate as a preservative were added to 950 milliliters of purified noncarbonated water and the solution was mixed by agitation. The pH of the solution was adjusted to 5.0 with 5 % sodium acid pyrophosphate. The volume of the solution was brought to 1 liter by the addition of purified water.

Example 4 - Cat Drink:

Two milliliters of a vitamin, mineral, and amino acid mixture suspended in 1 % sodium acid pyrophosphate (that contained vitamin E, vitamin A, alpha-tocopherol, ascorbic acid (C), vitamin B_{12}, vitamin D_3, folic acid, d-biotin, cyanocobalamin, niacinamide (B_3), thiamin, riboflavin (B_2), pyridoxin (B_6), menadione (K_3), betacarotene, calcium pantothenate, choline, inositol, zinc, iron, calcium, manganese, copper, iodine, sodium, potassium, alanine, arginine, aspartic acid, asparagine, cysteine, glutamic acid, glycine, glutamine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, taurine, threonine, tryptophan, tyrosine, and valine, 0.001 % by volume flavor (fish or chicken), 0.001 % sodium acid pyrophosphate, 0.001 % by weight citric acid, 0.0001 % by weight dextrose, 0.005 % by weight sodium benzoate as a preservative and 0.005 % by weight potassium sorbate as a preservative were added to 950 milliliters of purified noncarbonated water and the solution was mixed by agitation. The pH of the solution was adjusted to 5.0 with 5 % sodium acid pyrophosphate. The volume of the solution was brought to 1 liter by the addition of purified water.

Example 5 - Dog Drink:
Same recipe as Example 1 but no flavor added.

Example 6 - Dog Drink:
Same recipe as Example 1 but no sugar sweetener added.

Example 7 - Cat Drink:
Same recipe as Example 3 but no flavor added.

Example 8 - Cat Drink:
Same recipe as Example 3 but no dextrose added.

Example 9 - Dog Drink:
The ingredients per 3.785 l of dog drink were chosen as follows: 3.594 l purified water; 0.1893 l of 42% high fructose corn syrup; 21.03 mg niacin, 18.361 mg pantothenic acid, 19.629 mg ascorbic acid, 1.836 mg pyridoxine, 0.199 mg biotin; 2.5 mg leucine; 1.0 mg zinc gluconate; 1.5166 g potassium benzoate, 1.133 g potassium sorbate; 0.0004 l crispy beef flavor #F42722; and 0.0011 l of 75% phosphoric acid.

Example 10 - Cat Drink:
The ingredients per 3.785 l of dog drink were chosen as follows: 3.783 l purified water; 0.003785 g of D-glucose; 119.598 mg niacin, 26.550 mg pantothenic acid, 416.368 mg ascorbic acid, 10.617 mg pyridoxine, 0.127 mg biotin; 25.0 mg leucine, 25.0 mg taurine; 10.0 mg zinc gluconate; 1.5166 g potassium benzoate, 1.133 g potassium sorbate; 0.0004 l fish flavor #F48879, 0.0004 l butter flavor #F44609; and 0.0011 l of 75% phosphoric acid.

It should be noted that the dog drink compositions and the cat drink compositions are essentially different because the vitamin concentrations in each drink are adjusted to meet some % of the recommended daily requirements, which are very different for cats and dogs, respectively.

Exemplary ingredients and ingredient concentration ranges are listed as follows:

The fortified drinking water for dogs and cats in the foregoing examples 1-8 may consist of:

80 - 99.99% water;

0.0 - 15% sugar selected from a group consisting of dextrose (d-glucose), fructose, sucrose, long chain polysaccharides and any mixtures thereof;

0.0 - 5% natural or artificial flavor and any mixtures thereof;

0.0 - 15% vitamin, amino acid, electrolyte and mineral supplement and any mixtures thereof;

0.0 - 2% flavor enhancers consisting (such as sodium acid pyrophosphate, citric acid, and others listed in detail on attached pages)

0.0 - 1% preservatives selected from sodium benzoate and potassium sorbate and any mixtures thereof;

The vitamin supplement may include (by percentage of total vitamin weight):

0 - 100% vitamin C (ascorbic acid)
0 - 50% vitamin E
0 - 50% vitamin A
0 - 25% vitamin B2 (riboflavin)
0 - 25% vitamin B6 (pyridoxine)
0 - 25% vitamin B12
0 - 25% vitamin D3
0 - 25% d-biotin
0 - 25% alpha-tocopherol

0 - 25% beta-carotene
0 - 25% calcium pantothenate
0 - 25% cyanocobalamin
0 - 25% folic acid
0 - 25% thiamin
0 - 25% vitamin K3 (menadione)
0 - 25% choline
0 - 25% inositol

The electrolyte and mineral supplement may include (by percentage of total electrolyte and mineral weight):

0 - 100% zinc (as zinc chloride, oxide or gluconate)
0 - 100% sodium (as sodium chloride, gluconate or benzoate)
0 - 50% potassium (as potassium chloride, citrate, sorbate, or iodide)
0 - 15% calcium (as calcium chloride, gluconate or borogluconate)
0 - 15% copper (as copper chloride or gluconate)
0 - 15% iron (as iron chloride, oxide or gluconate)
0 - 15% iodine (as potassium iodide)

The amino acid supplement may include (by percentage of the total amino acid weight):

0 - 100% leucine
0 - 90% taurine
0 - 45% isoleucine
0 - 45% valine
0 - 45% glycine
0 - 45% lysine
0 - 15% alanine
0 - 15% arginine
0 - 15% aspartic acid
0 - 15% asparagine
0 - 15% cysteine

0 - 15% glutamic acid
0 - 15% glutamine
0 - 15% histidine
0 - 15% methionine
0 - 15% phenylalanine
0 - 15% proline
0 - 15% serine
0 - 15% threonine
0 - 15% tryptophan
0 - 15% tyrosine

The tartness and flavor enhancers include (by percentage of the total flavor enhancer weight):

0 - 100% sodium acid pyrophosphate
0 - 100% phosphoric acid
0 - 100% citric acid
0 - 50% potassium citrate
0 - 25% sodium pyrophosphate
0 - 25% sodium tripolyphosphate
0 - 25% tetrasodium pyrophosphate
0 - 25% sodium polyphosphate
0 - 25% sodium tripolyphosphate

Mixing recipe:

- Pour given volume of water into mixing chamber.

- While stirring, pour preservatives, Potassium Benzoate and Potassium Sorbate into the water in the mixing chamber.

- While stirring pour the blended mixture of powdered ingredients, Vitamins, Minerals, Amino Acids and D-Glucose (included in Thirsty Cat blend only) into the water in the mixing chamber.

- Continue stirring and add the liquid flavor, Crispy Beef #F42722 (for dog drink) and Tangy Fish #F48879 and Creamy Butter #F44609 (for cat drink).

- Stir until all ingredients are dissolved.

- Add 42% high fructose corn syrup while stirring (dog only).

- Add 75% phosphoric acid to set the pH to 4.0, while stirring.

- Add carbonation to achieve a 2-2.25% level of carbonation.

Note: All of the above steps should be followed when preparing the dog and cat recipes, except for the fifth step above (the cat drink doesn not contain high fructose corn syrup).

Analysis:

Protein	0.0%
Fat	0.0%
Fiber	0.0%
Moisture, Max	99.0%
Carbohydrates	0.0%
Vitamin C, Min	78.574 mg/L
Niacin, Min	31.597 mg/L
Pantothenic Acid, Min	7.014 mg/L
Vitamin B_6, Min	2.805 mg/L
Zinc Gluconate, Min	2.642 mg/L
D-Glucose, Min	0.977 mg/L
Taurine, Min	0.660 mg/L
Leucine, Min	0.660 mg/L
Biotin, Min	0.033 mg/L

Protein	0.0%
Fat	0.0%
Fiber	0.0%

Moisture, Max.....95.0%
Carbohydrates, Max.....5.0%
Niacin, Min.....5.556 mg/L
Pantothenic Acid, Min.....4.850 mg/L
Vitamin C, Min.....3.704 mg/L
Sodium, Min.....2.028 mg/L
Leucine, Min.....0.660 mg/L
Vitamin B_6, Min.....0.485 mg/L
Zinc Gluconate, Min.....0.264 mg/L
Biotin, Min.....0.052 mg/L

Claims:

1. A drink composition for pet animals, comprising, in percent by weight:

80 - 99.9% purified water;

0.0 - 15% sugar;

0.0 - 5% natural or artificial flavor and any mixtures thereof;

0.0 - 15% vitamin supplement, amino acid supplement, electrolyte and mineral supplement and any mixtures thereof;

0.0 - 1% preservatives;

and a tartness and palatability enhancer for adjusting the pH of the drink composition to below 5.5.

2. The drink composition according to claim 1, wherein said acidic additive is selected from the group consisting of sodium acid pyrophosphate, phosphoric acid and citric acid.

3. The drink composition according to claim 1, wherein the pH of the drink composition is adjusted to approximately 4.

4. The drink composition according to claim 1, wherein said sugar is selected from the group consisting of dextrose (d-glucose), fructose, sucrose, long chain polysaccharides and any mixtures thereof.

5. The drink composition according to claim 1, wherein said preservative is selected from the group consisting of sodium benzoate, potassium sorbate, any mixtures thereof, and carbon dioxide.

6. The drink composition according to claim 1, wherein said vitamin supplement includes, in percent of total vitamin weight:

0 - 100% vitamin C
0 - 50% vitamin E
0 - 50% vitamin A
0 - 25% vitamin B2
0 - 25% vitamin B6
0 - 25% vitamin B12
0 - 25% vitamin D3
0 - 25% d-biotin
0 - 25% alpha-tocopherol
0 - 25% beta-carotene
0 - 25% calcium pantothenate
0 - 25% cyanocobalamin
0 - 25% folic acid
0 - 25% thiamin
0 - 25% vitamin K3
0 - 25% choline
0 - 25% inositol

7. The drink composition according to claim 1, wherein said electrolyte and mineral supplement includes, in percent of total electrolyte and mineral weight:

0 - 100% zinc (as zinc chloride, oxide or gluconate)
0 - 100% sodium (as sodium chloride, gluconate or benzoate)
0 - 50% potassium (as potassium chloride, citrate, sorbate, or iodide)
0 - 15% calcium (as calcium chloride, gluconate or borogluconate)
0 - 15% copper (as copper chloride or gluconate)
0 - 15% iron (as iron chloride, oxide or gluconate)
0 - 15% iodine (as potassium iodide)

8. The drink composition according to claim 1, wherein said amino acid supplement includes, in percent of total amino acid weight:

0 - 100% leucine
0 - 90% taurine
0 - 45% isoleucine
0 - 45% valine
0 - 45% glycine
0 - 45% lysine
0 - 15% alanine
0 - 15% arginine
0 - 15% aspartic acid
0 - 15% asparagine
0 - 15% cysteine
0 - 15% glutamic acid
0 - 15% glutamine
0 - 15% histidine
0 - 15% methionine
0 - 15% phenylalanine
0 - 15% proline
0 - 15% serine
0 - 15% threonine
0 - 15% tryptophan
0 - 15% tyrosine

9. The drink composition according to claim 1, wherein said tartness and palatability enhancer includes, in percent of a total flavor enhancer weight:

0 - 100% sodium acid pyrophosphate
0 - 100% phosphoric acid
0 - 100% citric acid
0 - 50% potassium citrate
0 - 25% sodium pyrophosphate
0 - 25% sodium tripolyphosphate
0 - 25% tetrasodium pyrophosphate

0 - 25% sodium polyphosphate
0 - 25% sodium tripolyphosphate

10. A drink composition for pet animals, comprising, in percent by weight:

80 - 99% purified water;

1.0 - 15% sugar;

0.0 - 5% natural or artificial flavor and any mixtures thereof;

0.0 - 15% vitamin supplement, amino acid supplement, electrolyte and mineral supplement and any mixtures thereof;

0.0 - 1% preservatives;

a tartness and palatability enhancer for adjusting a pH of the drink composition to below 5.5.

11. The drink composition according to claim 10, wherein the pH of the drink composition is adjusted to approximately 4.

12. A drink composition for pet animals, comprising, in percent by weight:

80 - 99% purified water;

0.0 - 15% sugar;

0.0 - 5% natural or artificial flavor and any mixtures thereof;

1.0 - 15% vitamin supplement, amino acid supplement, electrolyte and mineral supplement and any mixtures thereof; and

a tartness and palatability enhancer for adjusting a pH of the drink composition to below 5.5.

13. The drink composition according to claim 12, wherein the pH of the drink composition is adjusted to approximately 4.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/04957

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A23L 2/00, 1/302, 1/304, 1/305
US CL :426/590, 72, 74
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)

U.S. : 426/590, 66, 72, 74, 805

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

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

APS
water and pH and sugar and (dog# or cat# or pet#)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4,309,417 (STAPLES) 05 January 1982, col. 7, line 40 to col. 8, line 22.	1, 2, 4, 6-10, 12
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Y		3, 5, 11, 13
A	US, A, 4,871,550 (MILLMAN) 03 October 1989.	
A	US, A, 5,017,389 (GREEN) 21 May 1991.	

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search 11 JUNE 1995	Date of mailing of the international search report 12 JUL 1995
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