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- as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii)) for the following designations AE,
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BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC,
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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: HARD BOUILLON TABLET

(57) Abstract: A hard bouillon tablet which comprises only or mainly oil and no or little fat beside non fat conventional bouillon ingredients.



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Hard bouillon tablet

The present invention relates to a hard bouillon tablet and to a process for the production of a hard bouillon tablet.

A conventional way of manufacturing hard bouillon tablets comprises mixing powdered bouillon components with fat and no or only little amounts of oil, and pressing the mix into tablet form.

Nowadays there is a nutritional trend to avoid or at least reduce consumption of fats rich in trans fatty acids and saturated fatty acids and to preferably consume healthy oils rich in monounsaturated fatty acids and/or polyunsaturated fatty acids such as sunflower, safflower, canola and/or olive oil, for example.

A first object of the present invention is to provide a hard bouillon tablet which only or mainly contains oil, especially a healthy oil rich in monounsaturated fatty acids and/or polyunsaturated fatty acids, and no or only little amounts of fat beside non fat conventional bouillon ingredients.

A second object of the present invention is to provide a hard bouillon tablet which has no or only little fat solidification after rehydration with hot water when the rehydrated product is getting cold.

A third object of the present invention is to provide a hard bouillon tablet which has an improved cold water solubility.

A fourth object of the present invention is to provide a hard bouillon tablet with an improved, fresh appearance,

especially if it comprises garnishes such as dehydrated vegetables and/or herb leafs, for example.

5 A fifth object of the present invention is to provide a process for manufacturing such a bouillon tablet.

It has now been found that the first four objects of the present invention can be met by a hard bouillon tablet which comprises, in total tablet weight %, from 1 to 20% of
10 an oil and possibly fat, up to 80%, preferably from 4 to 80% of a milled filler, up to 95% of a non milled filler, from 4 to 35%, preferably from 4 to 20% of a stickening or sticking agent, and, in total oil and fat weight %, up to 80% or even up to 70%, preferably up to 60% or even up to
15 50%, more preferably up to 40% or even up to 30%, even more preferably up to 20% or even up to 10%, and still even more preferably up to only 5% or even up to only 1% fat, as well as optionally spices, flavours, dehydrated vegetables, herb leafs and/or plant extracts.

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The fifth object of the present invention can be met by a process for the production of a hard bouillon tablet, which consists of preparing a dry premix of powdered constituents comprising, in total tablet weight %, up to 80%, preferably
25 from 4 to 80% of a milled filler and up to 95% of a non milled filler, atomising, in total tablet weight %, from 1 to 20% of an oil and possibly fat onto the dry premix while further mixing, optionally adding dehydrated vegetables and/or herb leafs, and tableting the final mixture thus
30 obtained, wherein, in total tablet weight %, from 4 to 35%, preferably from 4 to 20% of a stickening or sticking agent and optionally spices, flavours, and/or plant extracts are added to the dry premix or to the mixture of dry premix and oil, and wherein, in total oil and fat weight %, up to 80%
35 or even up to 70%, preferably up to 60% or even up to 50%, more preferably up to 40% or even up to 30%, even more

preferably up to 20% or even up to 10%, and still even more preferably up to only 5% or even up to only 1% fat are added to the dry premix or to the oil.

5 Throughout the present description, the expression "bouillon" is to be understood as meaning "bouillon and/or seasoning".

The expression "hard bouillon tablet" means "tablet
10 obtained by pressing a free flowing bouillon powder into a tablet form".

The expression "oil" means "oil or mixture of oils which is liquid at room temperature and which more especially has a
15 solid fat content (SFC) of less than 5% at 20°C".

The expression "milled filler" means "a powdered filler which has been milled to an especially fine granulometry or which has an especially fine granulometry".
20

The expression "non milled filler" means "a powdered filler which has not been milled to an especially fine granulometry or which does not have an especially fine granulometry".
25

Thus, it has surprisingly been found that it is possible to have only or mainly oil and no or only little fat entrapped in a hard bouillon tablet provided the tablet also comprises a milled filler and a stickening or sticking
30 agent.

In this way, it is indeed possible to provide a hard bouillon tablet which only or mainly contains oil, especially a healthy oil rich in monounsaturated fatty acids and/or polyunsaturated fatty acids , and no or only
35

little fat beside non fat conventional bouillon ingredients.

Thus, the present invention also involves a method for improving the nutritional quality of a hard bouillon tablet by at least partially replacing in the hard bouillon tablet, fats which contain trans fatty acids and/or saturated fatty acids with oils rich in monounsaturated fatty acids and/or polyunsaturated fatty acids.

Moreover, the present invention further involves a method for reducing consumption of trans fatty acids and/or saturated fatty acids by administering a food product prepared from a hard bouillon tablet in which fats which contain trans fatty acids and/or saturated fatty acids are at least partially replaced with oils rich in monounsaturated fatty acids and/or polyunsaturated fatty acids.

Such a hard bouillon tablet indeed has no or only little fat solidification after rehydratation with hot water when the rehydrated product is getting cold, and indeed has an improved cold water solubility.

In addition, the present hard bouillon tablet surprisingly appears to have an improved, fresher and nicer appearance than that of a traditional hard bouillon tablet, due to what may be called a natural polish of its surfaces as compared with the rather rough or mat surfaces of a traditional hard bouillon tablet.

Thus, the present invention further involves a method of improving the appearance of a hard bouillon tablet by at least partially replacing fats in the tablet with oils.

In the present hard bouillon tablet, the oil may be any suitable food grade oil such as chicken fat, not fractionated palm oil or palm olein, but preferably a healthy oil such as sunflower oil, olive oil, mais oil and/or canola oil, for example.

The fat may be palm fat or palm stearin, for example.

The milled filler may be a milled crystalline ingredient such as salt (sodium chloride), glutamate and/or sugar (sucrose), for example.

It may also be a fine powder of a porous ingredient such as maltodextrin, starch and/or cereal flour, which adsorbs the oil, for example.

A milled crystalline ingredient may have been milled to fine particles having a mean diameter of from 5 to 80 μm , for example.

The mean diameter is defined as a 50% limit (D50) in particle distribution whereby 50% by volume of the particles have a diameter below the 50% limit and 50% by volume of the particles have a diameter above the 50% limit.

Preferably, these fine particles also have a span of from 2.0 to 5.0.

The span is defined as the broadness or width in particle distribution between a 10% limit (D10) and a 90% limit (D90) divided by the mean particle diameter (D50), whereby 10% by volume of the particles have a diameter below the 10% limit and 10% by volume of the particles have a diameter above the 90% limit.

The so called non milled filler may be a powdered crystalline ingredient such as salt, glutamate and/or sugar which has not been milled to an especially fine granulometry but which comprises particles the mean
5 diameter of which is of from about 100 to about 600 μm , preferably from about 200 to about 600 μm and more preferably from about 300 to about 500 μm , for example.

The stickening or sticking agent may comprise ingredients
10 the addition of which (combined with an adequate increase of the A_w value) may impart a glass transition temperature to the final mixture which may be relatively easily exceeded during tableting. Such ingredients may comprise meat extract, processed flavours and/or maltodextrin, for
15 example.

In this case, the present hard bouillon tablet preferably comprises from 10 to 20% maltodextrin and 0.8 to 1.2% added
20 water.

This maltodextrin may have a DE value of from 5 to 60, preferably of from 10 to 60, more preferably of from 20 to 50 and even more preferably of from 10 to 30, and the A_w value of this hard bouillon tablet preferably is of from
25 0.3 to 0.5.

As stated above, the present process for the production of a hard bouillon tablet consists of preparing a dry premix of powdered constituents comprising, in total tablet weight
30 %, up to 80%, preferably from 4 to 80% of a milled filler and up to 95% of a non milled filler, atomising, in total tablet weight %, from 1 to 20% of an oil and possibly fat onto the dry premix while further mixing, optionally adding dehydrated vegetables and/or herb leafs, and tableting the
35 final mixture thus obtained, wherein, in total tablet weight %, from 4 to 35%, preferably from 4 to 20% of a

stickening or sticking agent and optionally spices, flavours, and/or plant extracts are added to the dry premix or to the mixture of dry premix and oil, and wherein, in total oil and fat weight %, up to 80% or even up to 70%, preferably up to 60% or even up to 50%, more preferably up to 40% or even up to 30%, even more preferably up to 20% or even up to 10%, and still even more preferably up to only 5% or even up to only 1% fat are added to the dry premix or to the oil.

Preparing the premix may be carried out by means of any suitable traditional powder mixer such as a horizontal mixer with plough-shaped heads arranged on its horizontal shaft or a ribbon mixer, for example.

The oil may be atomised onto the dry premix through any adequate nozzle such as a simple or a binary nozzle, for example. Further mixing preferably is combined with chopping in order to better agglomerate the oil with the milled filler.

The fat may be added either in solid form to the dry premix or in liquefied form to the oil, for example.

If maltodextrin is used as stickening or sticking agent, the added water may be incorporated by emulsification into the oil before atomisation, for example.

Tableting or pressing into a tablet form may be carried out under a pressure of from 10 to 1000 bar (1 to 100 MPa), preferably from 10 to 150 bar (1 to 15 MPa), for example.

A further, special advantage of an embodiment of the present process in which no or only little amounts of fat and only or mainly oil is used is that, in contrast with a conventional process, it is not necessary to ripen the mass

which can immediately be tableted. The fat in conventional hard bouillon tablets namely has to be cooled and crystallised either before or after adding the rest of the ingredients.

5

Embodiments of the hard bouillon tablet and of the process for producing it according to the present invention are illustrated in the following Examples in which the percentages are by weight unless indicated to the contrary.

10

The Examples are preceded by a short description of the method used for analysing the particle size of the milled filler.

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Method 1: Particle size analysis

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The particle size of the milled filler was analysed by means of a laser diffraction particle sizer (MASTERSIZER S, Malvern Instruments Ltd., Malvern/GB), coupled with a fully automated, air pressure controlled dry powder feeder (GMP ultra).

25

The result from the analysis was the relative distribution of volume of the particles in the range of size classes. Cumulative undersize curves and the following particle size distribution parameters were derived from these basic results:

30

D50: 50% limit = mean particle diameter (50% by volume of the particles had a diameter below D50 and 50% by volume of the particles had a diameter above D50)

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D10: 10% limit (10% by volume of the particles had a diameter below D10)

D90: 90% limit (10% by volume of the particles had a diameter above D90)

Span: $(D90 - D10) / D50$

5

Example 1

A hard, herb bouillon tablet was produced which had the following composition:

10

- 47 % milled salt
- 20 % milled monosodium glutamate
- 13 % maltodextrin with a DE value of 50
- 12 % olive oil
- 6.5 % dehydrated powdered aromatics and spices
- 1.4 % water containing plant extract solution (70 % water)
- 0.1 % dried herbs (like thyme or oregano)

15

20

The granulometry of the milled salt was as follows:

D10: 8.79 μm

D50: 44.45 μm

D90: 142.54 μm

25

Span: 3.0

The granulometry of the milled glutamate was as follows:

D10: 4.80 μm

30

D50: 27.27 μm

D90: 101.69 μm

Span: 3.55

The production process comprised the following steps:

35

The plant extract solution was emulsified with the olive oil in a high pressure homogenisator.

5 The emulsion was atomised on a premix of the powdered ingredients in a ploughshare mixer with chopper.

The dried herbs were added in the end.

10 The mixture thus obtained was tableted under a pressure of 10-150 bar.

15 The hard bouillon tablet thus obtained contained only olive oil, which is a healthy oil rich in monounsaturated fatty acids and/or polyunsaturated fatty acids, and no fat beside the non fat ingredients.

20 This tablet had no fat solidification after rehydratation with hot water when it was then getting cold and it also was cold water soluble.

Furthermore this tablet had a fresh and nice appearance due to what may be called a natural polish of its surfaces.

Example 2

25

A hard, vegetable bouillon tablet was produced which had the following composition:

- 30 • 44 % milled jodid containing salt
- 20 % milled monosodium glutamate
- 14 % maltodextrin with a DE value of 45
- 12 % sunflower oil
- 6.7 % powdered aromatics and spices (mainly vegetable flavours)
- 35 • 2 % dried vegetables

- 1.3 % colouring water based solution of plant extracts (e.g. curcuma)

5 The respective granulometries of salt and glutamate were as shown in Example 1.

The production process comprised the following steps:

10 The solution of plant extract was emulsified with the sunflower oil in a high pressure homogeniser.

The emulsion was atomised on a premix of the powdered ingredients in a ploughshare mixer with chopper.

15 The dried vegetables were added in the end.

The mixture thus obtained was tableted under a pressure of 10-150 bar.

20 The hard, vegetable bouillon tablet thus obtained contained only sunflower oil, which is a healthy oil rich in monounsaturated fatty acids and/or polyunsaturated fatty acids, and no fat beside the non fat ingredients.

25 This tablet had no fat solidification after rehydratation with hot water when it was then getting cold and it also was cold water soluble.

30 Furthermore this tablet had a fresh and nice appearance due to what may be called a natural polish of its surfaces.

Example 3

35 A hard, beef-type bouillon tablet was produced which had the following composition:

- 43 % milled salt
- 18 % maltodextrin with a DE value of 30
- 15.8 % powdered aromatics and spices (e.g. meat flavour)
- 11 % sunflower oil
- 5 • 9 % monosodium glutamate
- 1.8 % sugar
- 1 % additional water
- 0.4 % dried herbs (parsley)

10 The respective granulometries of salt and glutamate were as shown in Example 1.

The production process comprised the following steps:

15 The 1% additional water was emulsified with the sunflower oil in a fast rotating stirrer.

The emulsion was atomised on a premix of the powdered ingredients in a ploughshare mixer with chopper.

20

The dried herbs were added in the end.

The hard, beef-type bouillon tablet thus obtained contained only sunflower oil, which is a healthy oil rich in
25 monounsaturated fatty acids and/or polyunsaturated fatty acids, and no fat beside the non fat ingredients.

This tablet had no fat solidification after rehydratation with hot water when it was then getting cold and it also
30 was cold water soluble.

Furthermore this tablet had a fresh and nice appearance due to what may be called a natural polish of its surfaces.

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Claims

1. A hard bouillon and/or seasoning tablet which comprises, in total tablet weight %, from 1 to 20% of an oil and possibly fat, up to 80%, preferably from 4 to 80% of a milled filler, up to 95% of a non milled filler, from 4 to 35%, preferably from 4 to 20% of a stickening or sticking agent, and, in total oil and fat weight %, up to 80% or even up to 70%, preferably up to 60% or even up to 50%, more preferably up to 40% or even up to 30%, even more preferably up to 20% or even up to 10%, and still even more preferably up to only 5% or even up to only 1% fat, as well as optionally spices, flavours, dehydrated vegetables, herb leafs and/or plant extracts.
2. A hard bouillon and/or seasoning tablet according to claim 1, in which the oil is a healthy oil selected from a group comprising sunflower oil, olive oil, mais oil and/or canola oil.
3. A hard bouillon and/or seasoning tablet according to claim 1, in which the milled filler is a milled crystalline ingredient, especially a crystalline ingredient selected from a group comprising salt, glutamate and/or sugar.
4. A hard bouillon and/or seasoning tablet according to claim 3, in which the milled crystalline ingredient comprises fine particles having a mean diameter of from 5 to 80 μm and a span of from 2.0 to 5.0.
5. A hard bouillon and/or seasoning tablet according to claim 1, in which the stickening or sticking agent comprises an ingredient the addition of which (combined with an adequate increase of the Aw value) is capable of imparting a glass transition temperature to the final mixture which may be exceeded during tableting.

6. A hard bouillon and/or seasoning tablet according to claim 5, which comprises, as stickening or sticking agent, from 10 to 20% maltodextrin having a DE value of from 5 to 60, preferably of from 10 to 60, more preferably of from 20 to 50 and even more preferably of from 10 to 30, and from 0.8 to 1.2% added water.

7. A process for the production of a hard bouillon tablet, which consists of preparing a dry premix of powdered constituents comprising, in total tablet weight %, up to 80%, preferably from 4 to 80% of a milled filler and up to 95% of a non milled filler, atomising, in total tablet weight %, from 1 to 20% of an oil and possibly fat onto the dry premix while further mixing, optionally adding dehydrated vegetables and/or herb leafs, and tableting the final mixture thus obtained, wherein, in total tablet weight %, from 4 to 35%, preferably from 4 to 20% of a stickening or sticking agent and optionally spices, flavours, and/or plant extracts are added to the dry premix or to the mixture of dry premix and oil, and wherein, in total oil and fat weight %, up to 80% or even up to 70%, preferably up to 60% or even up to 50%, more preferably up to 40% or even up to 30%, even more preferably up to 20% or even up to 10%, and still even more preferably up to only 5% or even up to only 1% fat are added to the dry premix or to the oil.

8. A process according to claim 7, wherein the premix comprises, as stickening or sticking agent, from 10 to 20% maltodextrin having a DE value of from 10 to 60, preferably from 20 to 50, and from 0.8 to 1.2% of water are added in form of an emulsion in the oil.

9. A method for improving the nutritional quality of a hard bouillon and/or seasoning tablet by at least partially

replacing in the tablet, fats which contain trans fatty acids and/or saturated fatty acids with oils rich in monounsaturated fatty acids and/or polyunsaturated fatty acids.

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10. A method for reducing consumption of trans fatty acids and/or saturated fatty acids by administering a food product prepared from a hard bouillon and/or seasoning tablet in which fats which contain trans fatty acids and/or saturated fatty acids are at least partially replaced with oils rich in monounsaturated fatty acids and/or polyunsaturated fatty acids.

10

11. A method of improving the appearance of a hard bouillon and/or seasoning tablet by at least partially replacing fats in the tablet with oils.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23L1/40 A23L1/29 A23L1/314 A23L1/22 A23L1/325
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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)

IPC 7 A23L A23P

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 practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 021 483 A (PROCTER & GAMBLE) 7 January 1981 (1981-01-07) page 4, column 11 -page 6, column 31 page 9, line 1 - line 30 page 10, line 36 -page 13, line 6; claims 1,3-5; examples I,II ---	1-11
X	GB 1 470 646 A (CPC INTERNATIONAL INC) 14 April 1977 (1977-04-14) claims 1,3,4,9,10,12,15; examples 1-4 ---	1-11
X	EP 0 764 407 A (CPC INTERNATIONAL INC) 26 March 1997 (1997-03-26) page 2, line 52 -page 3, line 19; example --- -/--	1-11



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

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T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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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.
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Y	WO 98 12934 A (NESTLE SA ;MAHE YANNICK (FR); RUSTUEL PASCAL (FR); FROT COUTAZ ANN) 2 April 1998 (1998-04-02) page 3, line 14 - line 16; claims 1-4; examples ----	1-11
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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