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(54) Title: METHOD OF PRODUCING BEER FROM VETCH

(57) Abstract: The present invention relates to a method of producing beer through the alcoholic fermentation of malt with an addition of water and hops, using selected yeast strains, in which the material for producing malt is the grain of hairy (winter) vetch (Latin Vicia uillosa), a herbal plant species, whereby the said production of beer involves traditional stages ranging from malt production through wort production and violent fermentation of wort up to beer bottling. According to the invention, in the said method the bottling of beer takes place immediately after the completion of violent fermentation, with the young beer being refermented and clarified in the final container in which it is ready for consumption.

Method of producing beer from vetch

The present invention relates to a method of producing beer from vetch, which is applicable in particular to amateur beer brewing and beer production in small breweries.

Beer is an alcoholic beverage which is traditionally obtained through the alcoholic fermentation of malt with an addition of water and hops, using selected yeast strains. In addition, beer production involves the use of malt obtained in the process of malting cereal grains, chiefly barley. Other cereal species are less commonly used. Among beers of this style, the best known and the most highly regarded are beers made from wheat malt, for example the legendary Grodziskie beer, called Grodzisz, which was originally brewed in Wielkopolska in the region of Grodzisk Wielkopolski, probably from medieval times until the 20th century, similarly to wheat beers brewed in Germany or Belgium, which contain an addition of various other ingredients. For example, in Belgium beer is enriched with oats, coriander and orange peel.

Known is also a beer made from corn such as, for example, the beer type regionally called "chicha", the composition of which was already known during the times of the Inca empire, and which has been brewed continuously by the indigenous populations of South and Central America, mainly the Indians of the Andean region.

Moreover known are beer styles brewed from the malt of such cereals as spelt, rye, oats, millet, sorghum or rice. For example, in the territory of

Prussia there was a tradition of brewing beer using oats. The leading centres of such beer brewing were Giżycko and Węgorzewo, two towns in the Masurian Lake District, where the traditional grain bill consisted of two parts of barley malt and one part of oat malt. Malted oat grain has also been used for beer brewing since the turn of the 18th century in England and in Scotland. The top-fermented dark beer called "oatmeal stout" was brewed from deeply roasted barley malt with an addition of oat malt, having a characteristic colour ranging from dark brown to black and a discernible oat flavour giving the beer a nutty note. At present, beer containing oat malt is mainly produced in the UK, USA, Denmark and Australia. It is believed that beer made from oat malt can be an opportunity for producers of gluten-free foods, especially small regional breweries, to launch an innovative niche product for consumers with gluten intolerance.

Traditionally, beer brewing begins with the stage of malt production. The malting stage consists of grain (usually barley) steeping for about 3 days with the intention of creating appropriate conditions for the development of grain embryos and the emergence of cotyledon and radicle germs which trigger enzymatic activity and biochemical transformations. Steeping involves an increase in the volume of grain by ca. 45%, the swelling of such components as protein, starch and cellulose, changes in the colour of cereal grain from straw-yellow to brown, and the removal of undesirable bitter principles, tannins, polyphenols and other substances which could adversely affect the final taste of beer. The next stage is the process of controlled germination which takes about 7 days and involves grain development up to a certain stage, at the end of which the wet malt is dried in the process of kilning that lasts up to 2 days. The aim of the process is to achieve a complete destruction of embryonic vital functions, i.e. put a halt to germination and respiration, reduce the water content, stop enzymatic transformations while preserving the activity of enzymes generated during germination, produce aromatic and flavouring

substances in the malt, bring out the flavour and colour, and protect the malt from becoming spoiled during storage. The process of malt drying consists of two stages: preliminary drying in which the malt is dried at a temperature of 45–50°C, and the roasting stage, lasting 3–4 hours, which takes place at a temperature of 85°C. To obtain a dark malt, the temperature is increased to 105°C, and the roasting period is extended to 5 hours.

It is worthwhile to note that the use of malt in brewery processes depends on the beer style and the country in which beer is produced. There are regions where there is no tradition of using malt, and beer is made from unmalted cereal grains – for example in African countries.

Furthermore, beer is increasingly produced from carbohydrate sources other than malt and/or barley, i.e. using practically any source of starch and other additives. For instance, a beer called "masato" which is known in South America is made from crushed tubers of manioc – a type of shrub and perennial plants of the spurge family, having large edible root tubers.

Known from the Polish patent application description Z.392720 – "Beer composition and method of producing beer" – is a beer composition containing as one of its ingredients milk thistle – an annual herbal plant species of the Asteraceae family, resembling common thistle, closely related to sunflower, cultivated but also found wild. According to the description the beer composition includes water, ground malt, bottom-fermenting yeast, hop extract and milk thistle extract (with the following ratio of components: water 100 l, ground malt 10–50 kg, bottom-fermenting yeast 1.0–3.0 l, hop extract 10–30 g of alpha acids, milk thistle solution 15 l per 161 l of the wort).

Also known are beers based on other herbal plants. Even though it is presumed that there is currently no known method of beer production using vetch, historical records show that beer production based on vetch

was already known in Poland in early Middle Ages, i.e. in the 11th century, but was discontinued in the 16th century – probably as a result of the "beer purity regulation" issued by William IV, Duke of Bavaria, which stated that only water, hops and barley could be used for beer brewing.

A reference to a beverage called beer – made from barley, vetch or mixed cereals – can be found in the chronicle *The Deeds of the Princes of the Poles* (*Gesta principum Polonorum*) dating from as early as the 11th century, authored by Poland's first chronicler Gallus Anonymous. Beer brewed from wheat, barley, rye, spelt or vetch was also mentioned several centuries later by the 15th century Polish chronicler and historian Jan Długosz in his *Annals or Chronicles of the famous Polish Kingdom (Annales seu cronicae incliti Regni Poloniae).* There are also other 15th century references to a beer made from vetch. They are included in the manuscripts authored by an Italian named Enea Silvio de Piccolomini – a cardinal and bishop of Ermland, a papal legate in Poland during the reign of Casimir IV Jagiellon, later elected pope assuming the name of Pius II, whose pontificate was in the first half of the 15th century: "*Poland is a large country, touching Silesia on the west, and bordering with Hungary, Lithuania and Prussia. Cracow is the leading city in the Kingdom (...). Aside from Cracow, there are few prominent cities in Poland. The people there build their houses from kneaded clay. The whole land is shaded by forests, and the main beverage is beer brewed from barley or vetch. They do not know vineyards and they rarely drink wine. The fields are abundant with cereals, the people keep large livestock; they love hunting, and they hunt elks and bisons...*" ("Collection of Historical Diaries concerning Poland in Olden Times" by Julian Ursyn Niemcewicz, volume I).

However, no recipe for a beer made of vetch or a method for producing the beverage is known.

However the method of making beer from vetch was definitely much more primitive than traditional methods of beer brewing refined through centuries and comprising a succession of known stages ranging from malt

production through wort production and fermentation, beer conditioning and maturation, filtering – up to bottling.

Known is the stage of wort production in a brew-house. It commences with malt milling, i.e. grinding, that is the comminution of grain husks and crushing of cereal endosperm which are currently performed in roller grinders and/or hammer mills. The entire grain bill of ground malt is mixed with water at a temperature ranging from 37°C up to 80°C, most advantageously at a ratio of 100 kg of malt to 3.5–4.0 hl of water (the latter, in addition to malt, is the most essential component of beer production, and accounts for ca. 90% of the volume of the finished product). This is referred to as the mashing process which ultimately produces mash. It involves the hydrolysis of starch, proteins and other compounds. When the process of ground malt mashing is complete, the stage of filtering, i.e. mash lautering, is performed to obtain a clear liquid. Mash lautering is performed in a lauter tun or using a filter press. Filtering results in a clear first wort. After mash is pumped to a lauter tun, grain husks with endosperm residues and precipitated protein are sedimented at the bottom of the tun, creating a natural filtration layer called draff or spent grains. Lautering should be performed without any contact of mash with oxygen which has an adverse impact on the flavour properties of beer and gives it a darker colour. The quality of the wort is also affected by filtration time which can be reduced, for example, by providing the tun with agitators, so-called mash rakes, which are equipped with special cutting blades designed for mash churning. The separation of the wort is followed by the washing of draff with water (sparging of spent grains). Hot water (at a temperature of 70–80°C) is passed through the sediment remaining at the bottom of the tun to leach the spent grains, dissolve any remaining sugar and produce sweet wort with the extract content of 1–1.5% which is used at subsequent stages of beer production. The spent grains are usually utilized for feed purposes. Another filtering method uses a mash filter, and the entire process is

almost fully automated. The filter press consists of frames and vertically ribbed plates which are lined with plastic filter cloth. It retains draff when the mash flows under pressure through the filter. The use of a mash filter allows a faster and more uniform filtration.

When the mash is filtered, the wort is boiled with hops or hop products and possibly also with other unmalted components such as sugar, glucose, honey, fruit syrups, the purpose of which is to make the wort thicker, break down enzymes, dissolve the ingredients of hops, and precipitate tannin and protein substances. The wort is boiled at atmospheric pressure or increased pressure in a brew tank heated by steam, water or gas. In modern breweries, boiling takes 45–60 minutes, and in traditional breweries – up to 2.5 hours.

The next stage involves wort fermentation in tanks. In classical methods, fermentation takes place optionally in closed or open vessels – generally in standing or lying cylindro-conical tanks called tank fermenters or unitanks, with volumes exceeding 2,000 hl, which combine the functions of a fermentation tun and a conditioning tank. Fermentation is then performed under the pressure of 1 bar, and beer is intensively stirred, which reduces the entire fermentation cycle to 4–6 days. Depending on the kind of yeast used, fermentation can be of the bottom, top or spontaneous type. It is known that bottom-fermenting yeast requires lower temperatures (ca. 5–13°C) and is deposited at the bottom of the tun, whereas top-fermenting yeast accumulates on the surface and ferments at a temperature of 15–25°C. In some countries, however, such as Belgium, fermentation is also conducted with wild yeast strains.

Fermentation takes place in two stages. The first fermentation stage is referred to as violent (primary) fermentation – as opposed to secondary fermentation which occurs during beer conditioning in tanks or bottles Violent fermentation begins with the addition of yeast which multiplies very rapidly and intensively, increasing its weight by up to 3–4 times per day. In addition, it is assumed that 80% of sugars undergo

transformation during the initial 20% of fermentation time. Yeast reproduction ends when there is no oxygen left in the wort. Then, the process of alcoholic fermentation occurs, i.e. the conversion of fermenting sugars into ethyl alcohol, carbon dioxide and fermentation by-products. The process of fermentation depends mainly on the beer style, and differences are related to the amount of yeast added, the wort setting temperature and fermentation temperature. In dark beers the setting temperature and the fermentation temperature are usually higher than in light beers, and the fermentation period comprises a number of days which corresponds roughly to the percentage of extract contained in the primary wort. 20–25 hours after adding yeast, the low krausen stage (phase) occurs. This is a time when a layer of foam appears on the beer – initially in the form of bubbles and then forming a cover. The foam consists of hop resins and protein and tannin substances which are dissolved in the wort. After another 2–3 days fermentation achieves its peak point, i.e. the high krausen stage. During this period, the foam reaches its maximum height. There is an intensive release of carbon dioxide, the foam acquires a brown colour and the krausen is high. In the next phase, the so-called collapsing krausen stage, the fermentation process gradually decreases, the foam collapses into the brew, the yeast drops to the bottom forming flocculation or sometimes, in the case of top fermentation, floats on the surface in the form of a dense coat. Violent fermentation generally takes between 5 and 10 days.

The next stage occurring upon the completion of violent fermentation is the process of conditioning (also referred to as secondary fermentation or, in home-brewing, quiet fermentation). The stage of secondary fermentation is not obligatory.

For the duration of conditioning, the young beer is pumped for about two weeks into other vessels, advantageously airtight conditioning tanks, leaving sediments and most of the yeast at the bottom, or optionally the entire fermentation is carried out in a single fermentation tank, leaving

the beer in the same vessel, in which case the process takes 2–4 weeks. The main purpose of conditioning is to continue the fermentation of maltose, saturate the beer with carbon dioxide, achieve an appropriate level of attenuation, clarify the beer and create a desirable flavour and aroma bouquet, among others by breaking down diacetyl which is contained in the beer as a fermentation by-product. Modern breweries often artificially inject their beer with carbon dioxide which removes volatile compounds responsible for the scent of young beer and markedly reduces the conditioning period. The process of conditioning, i.e. after-fermentation and maturation of beer, should take place at a temperature of –1 to +1°C at an overpressure of above 0.03 MPa for bottom-fermenting beers, and at 10–12°C for top-fermenting beers. Depending on the beer type, the process takes 4–6 weeks in the case of classical fermentation or 2–3 weeks in fermentation tanks. Some beer styles, however, require a maturation period of several months.

The next stage is beer filtration. The purpose is to remove suspensions remaining after fermentation which cause cloudiness or iridescence, and give the beer clarity and shine. The beer is filtered through diatomaceous earth (ground sedimentary rock built of strongly porous diatoms) or membranes (microfiltration), using filters, advantageously a plate filter, frame plate filter, cartridge filter or horizontal screen filter. Additionally performed processes include colloidal stabilization of beer using silica gels or synthetic gels (PVPP – polyvinylpyrrolidone) and carbonization, i.e. saturation of beer with carbon dioxide to ca. 0.5%. Filtration also involves the addition of antioxidants (ascorbic acid, sodium sulphite). In the case of beer brewed using the HGB method (high gravity brewing – highly concentrated wort brewing to ca. 16–18%), the desirable extract of the finished beer is achieved before bottling through water dilution.

Most of the beer produced for sale in chain stores is sterilized by pasteurization, through which it achieves a higher microbiological stability. Breweries typically use a plate heat exchanger through which

beer heated to the temperature of 70°C flows for ca. 2 minutes. Unpasteurized beer retains a full range of flavour qualities, however its shelf-life is only several weeks.

When filtration and pasteurization are complete, the beer is filled into a variety of containers including bottles, cans, barrels or kegs.

Known are also less traditional beer production methods in which the beverage is made in a very labour-intensive and complicated technological process.

Known is, for example, a method of producing the above-mentioned Grodziskie beer. The beer, which is not currently produced, used to be made from wheat malt smoked in oak or beech wood smoke. It was flavoured with hops from plantations located in the Wielkopolska region. As a result, the beer not only had a characteristic mildly bitter hop flavour but also a characteristic aroma of smoked malt. Grodziskie beer was subjected to a short fermentation in barrels at a temperature from 15 to 20°C, after which it was lautered with isinglass – a glue-like substance obtained from the swim bladders of fish belonging to the family Acipenseridae, mainly beluga and sturgeon. Next, lautered and filtered beer was combined with the primary wort which had already passed the stage of boiling the malt mash with hops, had been filtered and cooled down to the setting temperature, i.e. appropriate for the addition of yeast in order to subject it to fermentation. Omitting the traditional stage of violent (primary) fermentation, even before the stage involving the addition of yeast, the beer was transferred into bottles with a special yeast strain, specific only to this beer style, and stored for a month on the shelves in a conditioning cellar, where it underwent refermentation (secondary fermentation) and matured. The refermentation contributed to increasing the beer extract concentration and the content of carbon dioxide and yeast sediments, and also changed the pH of the beer. Following refermentation, the beer was more cloudy and had a richer taste. Since the beer matured in bottles, an intensive natural effervescent

effect was created when opening a bottle: very thick foam and abundant bubbles formed, hence the Grodziskie beer was even casually referred to as the *Grodzisk champagne.* Furthermore, the finished beer had characteristic yeast sediment at the bottom of the bottle.

The present invention relates to a method of producing beer through the alcoholic fermentation of malt with an addition of water and hops, using selected yeast strains, in which the material for producing malt is the grain of hairy (winter) vetch (Latin *Vicia villosa*), a herbal plant species, whereby the said production of beer involves traditional stages ranging from malt production through wort production and violent fermentation of wort up to beer bottling, however with the omission of the stage of beer conditioning and maturation in the fermentation tank, and the stage of beer filtering and removal of sediments and suspensions, with the beer being bottled immediately after completing violent fermentation, whereupon the young beer undergoes refermentation in the vessel in which it is ready for consumption.

According to the present invention the method of beer production consists of the following stages. First, the grain of hairy vetch is cleaned and then steeped for about 3 hours, whereupon the grain is placed on a flat surface and arranged in the form of a pile, where the process of drying wet malt takes place advantageously at a temperature of 5–10°C, and is left to germinate for about 6–7 days. The germinated grain is roasted advantageously at a temperature of 150°C for about 1.5 hours. Roasting is followed by the stage of wort production, during which the entire grain bill of malt (not ground, only roasted) is poured over with water at a temperature of 40–45°C at a ratio of 1 kg of malt to 10 l of water, combined with hops in the form of dried cones or leaves in an amount of 1.5 g per 1 l of mash, and mixed by the method of rising infusion – initially at a temperature of 40–45°C for 30 minutes, whereby after 30 minutes of mixing the temperature is increased to the boiling point

(100°C), and the wort is then boiled in a brew tank under cover for about one more hour.

In the next stage, the wort is transferred to a fermentation tank, separating the malt and hops residues, and the wort is cooled down to a temperature below +25°C, following which dissolved sugar is added at a ratio of 1 kg to 15 l of the wort (the sugar is previously dissolved in water at a ratio of 1 kg of sugar to 4 l of water) and top-fermenting brewer's yeast is added, fermenting at a temperature of 15–25°C, at a ratio of 7 g to 30 l of the wort, whereupon the fermentation tank is tightly closed for 14 days, ensuring a constant temperature, advantageously 18–22°C, until the completion of violent fermentation. After the completion of violent fermentation the young beer is transferred to bottles, and sugar is again added to each bottle at a ratio of about 1%, i.e. 0.5 g per one 0.5 l bottle. The process of conditioning, i.e. after-fermentation and maturation of beer, as well as its clarification, takes place in bottles and lasts a minimum of 10 days. After that stage, the beer is ready for consumption.

The vetch beer obtained using the method according to the invention can be recognized as a new style of beer, characterized by an amber colour and specific flavour qualities. In particular, the transfer of beer into bottles prior to the stage of beer conditioning and maturation contributes to increasing the beer extract concentration and the content of carbon dioxide, and also changes the pH of the beer. The vetch beer, subjected to refermentation, has a richer taste and a slight cloudiness, and as a result of the stage of clarification occurring in bottles, it has characteristic yeast sediment at the bottle bottom. A specific attribute of the vetch beer is certainly foam. It is recommended that the vetch beer produced using the method according to the invention should, after bottle opening, be poured into tall and slender glassware (for example weizen glasses or goblets) on account of very abundant and stable foam produced in the beer as a result of the natural activity of yeast and the presence of carbon dioxide, and also due to the proteins contained in the vetch malt

(vetch has large amounts of proteins, particularly the type referred to as protein Z and a protein from the LTP1 group, whereby the latter performs a foaming function, and protein Z significantly affects the stability (retention) of foam.

The object of the invention is presented in a greater detail in the exemplary embodiment below.

According to the invention, a total of 10,000 bottles of the vetch beer, with a volume of 0.5 l each, were produced in a small local brewery.

To this end, warehouse-stored hairy vetch grain in the amount of 1.35 t was first cleaned. Next, the grain was steeped for 3 hours, whereupon it was placed on a flat surface in the form of a pile, where the process of drying wet malt took place at a temperature of 5–10°C, and it was left to germinate for 7 days, whereby after 3 days the grain was stirred regularly once a day to ensure uniform germination. The germinated grain was roasted at a temperature of 150°C for 1.5 hours. One ton of vetch malt was obtained.

Malt roasting was followed by the stage of wort production, during which the entire grain bill of the malt, in the amount of 1 t, was transferred to a brew tank and poured over with water at a temperature of 40–45°C at a ratio of 1 kg of malt to 10 l of water, i.e. in this case 1 t of malt was poured over with 100 hl of water, following which hops in the form of dried cones were added in the amount of 1.5 kg per 10 hl of the mash, and mixed by the method of rising infusion – initially at a temperature of 45°C for 30 minutes, and after 30 minutes of mixing the temperature was increased to the boiling point (100°C), whereupon the wort was boiled in the brew tank under cover for another hour.

In the next stage, the wort was transferred to a fermentation tank, separating the sediment at the bottom of the tank in the form of malt and hops residues, and the wort was cooled down to a temperature below +25°C. Next, dissolved sugar was added at a ratio of 6.6 kg to 1 hl of the

wort (the sugar had been previously dissolved in water at a ratio of 1 kg to 4 l of water) and top-fermenting brewer's yeast was added, fermenting at a temperature of 15–25°C, at a ratio of 23 g to 1 hl of the wort, ensuring that the water had a constant temperature of about 20°C. After that, the fermentation tank was tightly closed for 14 days, ensuring a constant temperature of 19°C until the completion of violent fermentation. When violent fermentation was over, the young beer was transferred to bottles with a volume of 0.5 l, and sugar was again added to each bottle at a ratio of 0.5 g per one 0.5 l bottle. The process of conditioning, i.e. after-fermentation, maturation and clarification of beer, took place in bottles and lasted 14 days. After that stage, the beer was ready for consumption and a small amount of sediment remained at the bottom of each bottle.

Claims

1. Method of producing beer through the alcoholic fermentation of malt with an addition of water and hops, using selected yeast strains, in which the material for producing malt is the grain of hairy (winter) vetch (Latin *Vicia villosa*), a herbal plant species, whereby the said production of beer involves traditional stages ranging from malt production through wort production and violent fermentation of wort up to beer bottling, **wherein** the bottling of beer takes place immediately after the completion of violent fermentation, with the young beer being refermented and clarified in the final container in which it is ready for consumption.

2. The method of producing beer according to claim 1, **wherein** the grain of hairy vetch is first cleaned and then steeped for about 3 hours, whereupon the grain is placed on a flat surface and arranged in the form of a pile, where the process of drying wet malt takes place advantageously at a temperature of 5–10°C, and it is left to germinate for about 6-7 days, whereby the germinated grain is roasted advantageously at a temperature of 150°C for 1.5 hours, and roasting is followed by the stage of wort production during which the entire grain bill of the malt is poured over with water at a temperature of 40–45°C at a ratio of 1 kg of malt to about 10 l of water, following which hops in the form of dried cones or leaves are added in the amount of 1.5 g per 1 l of the mash and mixed by the method of rising infusion – initially at a temperature of 40–45°C for 30 minutes, and after

30 minutes of mixing the temperature is increased to the boiling point (100°C), whereupon the wort is boiled in the brew tank under cover for about one more hour, and in the next stage the wort is transferred to a fermentation tank, separating the malt and hops residues, and the wort is cooled down to a temperature below +25°C, following which dissolved sugar is added at a ratio of 1 kg to 15 l of the wort, and top-fermenting brewer's yeast is added, fermenting at a temperature of 15–25°C, at a ratio of 7 g to 30 l of the wort, whereupon the fermentation tank is tightly closed for 14 days, ensuring a constant temperature, advantageously 18–22°C, until the completion of violent fermentation, at which point the young beer is transferred to bottles, and sugar is again added to each bottle at a ratio of about 1%, so that the process of conditioning, i.e. after-fermentation, maturation and clarification of beer, takes place in bottles and lasts a minimum of 10 days, after which period the beer is ready for consumption.

INTERNATIONAL SEARCH REPORT

International application No
PCT/PL2016/000083

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12C7/053 C12C11/00 C12C12/00
ADD.

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)
C12C

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2013/068999 A1 (AUDACIA WINES PTY LTD [ZA]) 16 May 2013 (2013-05-16) claims 1,4	1,2
A	DE 923 604 C (KOMM ERNST DR) 17 February 1955 (1955-02-17) paragraph [0007]; claim 1	1,2
A	FR 384 745 A (ALBERT KUMMLE [DE]) 18 April 1908 (1908-04-18) the whole document	1,2

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

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
21 March 2017	05/04/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Diller, Reinhard

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/PL2016/000083

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"LECONS FOURNIES PAR LES BIERES DE GUERRE", PETIT JOURNAL DE BRASSEUR - KLEINE BROUWERSBLAD, BRUSSELS, BE, vol. 55, no. 2130, 7 February 1947 (1947-02-07), pages 98-102, XP000619053, ISSN: 0031-6253 the whole document	1,2
A	WO 2014/207542 A1 (MARIUZZO OLIMPIA [IT]) 31 December 2014 (2014-12-31) the whole document	1,2

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/PL2016/000083

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