



No. 03-096838- -00007-0000

Fecha: 2008-05-12 16:16:35 Dep. 2020 NUECREACIONE  
Tra. 11 PATENTEIYII Evs: 379 FASENACIONALII  
Act. 444 RESPUESTAREQUE Folios: 6

Señora

Alix Carmenza Céspedes de Vergel

Jefe de División de Nuevas Creaciones

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

E. \_\_\_\_\_ S. \_\_\_\_\_ D. \_\_\_\_\_

Referencia: Expediente No. 03.096.838

Solicitud de Patente de Invención: "Método para entregar sabor fresco en  
una bebida que se sirve en el sitio"

Solicitante: Pepsi/Lipton Tea Partnership

**RESPUESTA AL AUTO NOTIFICADO POR FIJACIÓN EN LISTA NO. 469****DEL 28 DE DICIEMBRE DE 2007, OFICIO NO. 16797 (EXAMEN DE FONDO)**

ÁLVARO CORREA ORDÓÑEZ, mayor de edad y vecino de Bogotá D.C., identificado tal como aparece al pie de mi firma, en mi carácter de apoderado de la sociedad en referencia, doy respuesta al auto emanado por ese Despacho dentro del término de prórroga solicitado en mi memorial 03-096838-00006-0000 de fecha 25 de marzo de 2008:

**1. Objeciones del Examinador****De la solicitud de patente**

Manifiesta su Despacho que la reivindicación 1 tal y como se presenta no proporciona características técnicas que lo diferencien de un procedimiento corriente.

Se dice que la reivindicación 14 presenta otro método en el cual se proporciona a la bebida un componente no estable el cual no esta definido al igual que un componente inestable.

Se plantea que las reivindicaciones 17 a 29 presentan una bebida de té helado que se debe caracterizar por los componentes que la constituyen y que se deben diferenciar las reivindicaciones de método de las de producto y no caracterizar las etapas de producto por etapas.

|                                      |                       |
|--------------------------------------|-----------------------|
| Expediente No. 03.000.878            | Expediente            |
| Solicitud de Patente de Invención    | Solicitud             |
| una bebida que se hace en el sitio   | una bebida            |
| Forma y procedimiento de fabricación | Forma y procedimiento |

Robertson, J. L. 2003. 100

continued on inside cover

[illegible]

Finalmente se afirma que el capítulo reivindicatorio carece de unidad de invención ya que no es posible caracterizar el concepto común inventivo en vista de que se presentan dos métodos diferentes.

## 2. Respuesta a las objeciones planteadas

### De la solicitud de patente.

En respuesta a las objeciones planteadas a las reivindicaciones el solicitante presenta un nuevo capítulo reivindicatorio el cual da respuesta a todas las objeciones planteadas.

Para que la anterior modificación surta efecto, adjunto el formulario de modificación voluntaria a solicitud pendiente y la tarifa establecida por ese Despacho para este trámite.

El solicitante desea manifestar que el único documento que se cita en el reporte de búsqueda internacional es el US 3,966,986 en donde se agrega el agente saborizante de tal forma que la bebida de té final contiene aproximadamente 0.01 – 25 ppm de agente saborizante agregado. Los parámetros específicos de la reivindicación 3 se han incorporado ahora a la reivindicación 1 lo cual lo distinguiría claramente de esta referencia.

En virtud de lo anterior, solicito que se acepten el nuevo capítulo reivindicatorio y se conceda el derecho a la patente.

Atentamente,



ÁLVARO CORREA ORDÓÑEZ

C.C.No.79.143.366 de Usaquén

T.P.20.281

Anexos:           Capítulo reivindicatorio modificado  
                  Formulario de modificación  
                  Recibo

4.1

SECRET

Finalmente se afirma que el capítulo reivindicatorio carece de unidad de invención ya que no es posible caracterizar el concepto común inventivo en vista de que se presentan los métodos distintos.

3. Respuesta a las objeciones planteadas

De la solicitud de patente

En respuesta a las objeciones planteadas a las reivindicaciones el solicitante presenta un nuevo capítulo reivindicatorio el cual da respuesta a todas las objeciones planteadas.

Para que la anterior modificación surta efecto, según el formulario de modificación volumina a solicitud pendiente, la misma establecida por ese despacho para este trámite.

El solicitante desea manifestar que el único documento que se cita en el reporte de búsqueda internacional es el US 3,966,986 en donde se agota el estado de la técnica de tal forma que la fecha de la final comitee aproximadamente 0-01 - 22 años de fecha de publicación. Los parámetros y especificaciones de la reivindicación 3 se han incorporado a la reivindicación 1 lo cual lo distingue claramente de esta referencia.

En virtud de lo anterior, sobre lo que se acepta el nuevo capítulo reivindicatorio y se concede el derecho a la patente.

Atentamente,

ALVARO CORREA ORDOZUELA  
C. 140.70.143.300 de Toluca

EP-20.081

Verificación  
Capítulo reivindicatorio modificado  
Formulario de modificación  
Recibido

RECIBIDO 13-05-71 13:11 - 13-05-71 13:11

FORMULARIO UNICO DE CORRECCIONES Y MODIFICACIONES

1

SOLICITUD DE

☐ Corrección de Error Material ☒ Modificación de una solicitud

2

SOLICITANTE

Nombre: PEPSI/LIPTON TEA PARTNERSHIP

Dirección: 700 Anderson Hill Road, Purchase, Nueva York 10577,  
Estados Unidos de América

Nacionalidad o Domicilio: Estadounidense

Lugar de Constitución: Nueva York, Estados Unidos de América

Teléfono:

Fax:

E-Mail

IDENTIFICACION

C.C. ☐ NIT ☐

C.E. ☐ Otro ☐

Número  Cual

REPRESENTANTE  
O APODERADO

Nombre: ALVARO CORREA ORDOÑEZ

Dirección: Avenida 82 No.10-62 Piso 6o.

Teléfono: 634 1500

Fax: 376 2211

E-Mail: patents.bogota@bakernet.com

IDENTIFICACION

C.C. ☒ NIT ☐

C.E. ☐ Otro ☐

Número 79.143.366 TP 20.281

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Numero de expediente

03.096.838

Descripción de la corrección o modificación solicitada

El solicitante presenta capítulo reivindicatorio modificada con

respuesta a auto de fondo No. 16797

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Comprobante de Pago No.

08 - 23005

Fecha

17-MAR-08

7

Anexos

☒ Comprobante de pago de la tasa.

☐ Poderes, si fuere el caso.

☐ Documento que acredita la existencia y representación legal de las partes, cuando sean personas jurídicas.

8

NOMBRE ALVARO CORREA ORDOÑEZ

FIRMA

C.C. 79.143.366

T.P. 20.281

Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página.

FORMULARIO UNICO DE CORRECCIONES Y MODIFICACIONES

INSTITUTO VENEZOLANO DE INVESTIGACIONES CIENTÍFICAS

SECCION DE INVESTIGACION

PROCESO DE INVESTIGACION

FECHA DE RECEPCION

FECHA DE EMISION

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IDENTIFICACION

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

2008 / 00647

RECIBO OFICIAL DE CAJA : 08 - 23,005  
FECHA : MARZO 17 DE 2008

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 03-096838- -00007-0000

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Tra. 11 PATENTEIYII Eve: 379 FASENACIONALI  
Act. 444 RESPUESTAREQUE Folios: 6

\*\*\*\*\* CONSIGNACION \*\*\*\*\*

| DEPOSITANTE      | TIPO PAGO    | BANCO           | CUENTA    | No. PAGO | FECHA PGO  | Vr PAGO       |
|------------------|--------------|-----------------|-----------|----------|------------|---------------|
| BAKER & MCKENZIE | CONSIGNACION | BANCO DE BOGOTA | 062754387 | 116634   | 14/03/2008 | 52,393,368.05 |

\*\*\*\*\* CONCEPTO \*\*\*\*\*

| NT. RENTISTICO                               | CONCEPTO                      | TOTAL CONCEPTO |
|----------------------------------------------|-------------------------------|----------------|
| 1 50005-01-03 CAMBIO DE MODALIDAD Y MODIFICA | 12 MARCAS Y LEMAS COMERCIALES | 103,000.00     |
|                                              | TOTAL :                       | \$ 103,000.00  |

SON: CIENTO TRES MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No.

RECIBO DE CASH RECIBIDO DE INMEDIATA NO.

CONCEPTO:

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VERIFICACION

CONCEPTO

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## REIVINDICACIONES

1. Un método para entregar un sabor a té de infusión fresca a una bebida de té helado en el sitio, en el lugar donde se dispensa, que comprende los pasos de:

(a) proporcionar compuestos de sabor a té en una cantidad suficiente para entregar sabor a té de infusión fresca separado de los sólidos del té antes del momento de la dispensación; y

(b) mezclar los compuestos del sabor a té con los sólidos del té en el momento en que se dispensa, en donde los compuestos de sabor a té son proporcionados en una cantidad de 0.01 a 12% por peso de la bebida de té helado terminado.

2. El método de la reivindicación 1 en donde los compuestos de sabor a té comprenden sabor a té, aroma a té o una combinación de los mismos.

3. El método de la reivindicación 1, en donde los compuestos de sabor a té se proporcionan en una cantidad de 0.02 a 5% por peso de la bebida de té helado terminado.

4. El método de la reivindicación 3, en donde los compuestos de sabor a té se proporcionan en una cantidad de 0.03 a 2% por peso de la bebida de té helado terminado.

5. El método de la reivindicación 1, en donde los compuestos de sabor a té se proporcionan junto con un edulcorante.

# REIVINDICACIONES

1. El método para entregar un sabor a té de infusión fresca a una bebida de té helado en el sitio, en el lugar donde se dispensa, que comprende los pasos de:

(a) proporcionar compuestos de sabor a té en una cantidad suficiente para entregar sabor a té de infusión fresca separada de los sólidos del té antes del momento de la dispensación; y

(b) mezclar los compuestos del sabor a té con los sólidos del té en el momento en que se dispensa, en donde los compuestos de sabor a té son proporcionados en una cantidad de 0.01 a 1.2% por peso de la bebida de té helado terminado.

2. El método de la reivindicación 1 en donde los compuestos de sabor a té comprenden sabor a té, aroma a té o una combinación de los mismos.

3. El método de la reivindicación 1, en donde los compuestos de sabor a té se proporcionan en una cantidad de 0.01 a 2% por peso de la bebida de té helado terminado.

4. El método de la reivindicación 3, en donde los compuestos de sabor a té se proporcionan en una cantidad de 0.03 a 2% por peso de la bebida de té helado terminado.

5. El método de la reivindicación 1, en donde los compuestos de sabor a té se proporcionan junto con un edulcorante.

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6. El método de la reivindicación 5, en donde el edulcorante se selecciona entre el grupo que consiste de sucrosa, jarabe de maíz de alta fructosa, jarabe de maíz, miel, melaza y combinaciones de los mismos.

7. El método de la reivindicación 5, en donde el edulcorante se acidifica y preserva.

8. El método de la reivindicación 7, en donde el edulcorante se acidifica con un acidulante seleccionado entre el grupo que consiste de ácido fosfórico, ácido cítrico, ácido láctico, ácido fumárico y combinaciones de los mismos.

9. El método de la reivindicación 7, en donde el edulcorante se preserva con un preservativo seleccionado entre el grupo que consiste de benzoato, sorbato y combinaciones de los mismos.

6. El método de la reivindicación 5, en donde el elemento se selecciona entre el grupo que consiste de sueros, fajas de malla de alta tracción, fajas de malla, mallas y combinaciones de los mismos.

7. El método de la reivindicación 5, en donde el elemento se acidifica y preserva.

8. El método de la reivindicación 7, en donde el elemento se acidifica con un ácido que se selecciona entre el grupo que consiste de ácido fosfórico, ácido cítrico, ácido láctico, ácido succínico y combinaciones de los mismos.

9. El método de la reivindicación 7, en donde el elemento se preserva con un preservativo seleccionado entre el grupo que consiste de peróxido, sorbato y combinaciones de los mismos.

10. El método de la reivindicación 7, en donde el elemento se preserva con un preservativo seleccionado entre el grupo que consiste de peróxido, sorbato y combinaciones de los mismos.

# United States Patent [19]

Hunter et al.

[11] 3,966,986

[45] June 29, 1976

## [54] METHOD FOR ENHANCING TEA FLAVOR AND PRODUCT THEREOF

[75] Inventors: George L. K. Hunter, Atlanta, Ga.; Victor Krampl, Essen, Germany; Charles Thomas Malone, Doraville, Ga.; Gerald Edward Usher, Reading, England

[73] Assignee: Tenco Brooke Bond Limited, London, England

[22] Filed: Oct. 29, 1974

[21] Appl. No.: 518,305

### Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 327,056, Jan. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 71,411, Sept. 11, 1970, abandoned.

[52] U.S. Cl. .... 426/534; 426/536; 426/538; 426/597;

[51] Int. Cl.<sup>2</sup> ..... A23F3/00; A23L1/22

[58] Field of Search ..... 426/597, 534, 536, 538, 426/650, 651, 386, 387

### [56] References Cited

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| 2,137,374 | 11/1938 | Wright        | 426/597   |
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| 2,476,072 | 7/1949  | Tressler      | 426/597   |
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| 3,689,278 | 9/1972  | Carbonell      | 426/597   |
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Chemistry of Tea & Tea Manufacture, Stahl, pp. 228-231.

J. Agr. Food Chem., pp. 36-47, Bondarovich et al.

Primary Examiner—Steven L. Weinstein

Attorney, Agent, or Firm—Robert A. Lester; John R. Martin; W. Dexter Brooks

### [57] ABSTRACT

A method for enhancing the flavor and aroma of a final tea beverage prepared from a soluble tea, e.g., a concentrated tea extract or a dried soluble tea, by adding a flavoring agent to the soluble tea to produce a final tea beverage containing about 0.01-25 ppm of the added flavoring agent. The flavoring agent, having different preferred compositions for cold and hot-water soluble products, includes up to 39 selected flavoring constituents in specified amounts.

74 Claims, No Drawings

Patent No. 2,900,000  
 Filed June 23, 1959

United States Patent  
 2,900,000

1. A method for separating the lower and upper ends of a...  
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In Claim, no drawing

# METHOD FOR ENHANCING TEA FLAVOR AND PRODUCT THEREOF

## CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. pat. appl'n Ser. No. 327,056 filed Jan. 26, 1973, now abandoned, which in turn is a continuation-in-part of U.S. pat. appl'n Ser. No. 71,411 filed Sept. 11, 1970, now abandoned.

## BACKGROUND OF THE INVENTION

This invention relates, generally, to tea flavor enhancement and, in particular, to the addition of flavoring substances to soluble tea in an amount and composition for achieving the flavor and aroma of fresh tea in a finally-reconstituted tea product.

There are presently available a wide variety of tea products that are sold commercially, for example green tea, black tea, soluble tea compositions and liquid teas.

Green tea is categorized as including freshly-gathered tea leaves, tea leaves that have been freshly-gathered and dried immediately, tea leaves that have been heat treated before drying, and aqueous extracts of these tea leaves. In each instance, the green tea has undergone substantially no fermentation to the black state.

Black tea, on the other hand, is generally made from green tea leaves by subjecting the leaves to a series of processing conditions including (1) withering, (2) rolling or otherwise breaking up the cells to initiate enzymic activity, (3) fermenting, and (4) firing. Rolling or otherwise breaking up the cells initiates the enzymic reaction of fermentation during which the character, color, flavor and aroma of black tea are developed. When the fermentation has progressed sufficiently, it is arrested by firing the tea leaves (i.e. drying) and the resulting product possesses the characteristic appearance, flavor, color and aroma of black tea.

Instant or soluble tea compositions, generally classified as either cold or hot-water soluble teas, are customarily prepared from the black tea leaves by extracting them either before or after they are dried. The extract (a) is then concentrated (b) may be dried if so desired and (c) otherwise processed according to well-known methods to produce cold and/or hot-water soluble teas.

It is well recognized in the beverage field that the flavor and aroma of tea beverages reside primarily in their volatile components. Accordingly, conventional soluble tea products, while commercially acceptable, leave much to be desired since very substantial amounts of these volatile components are lost during the processing operation necessary to convert the leaf tea of commerce into soluble tea products. These losses of volatiles occur at various processing stages, but in particular during (a) the step of concentration of the dilute extract, and (b) the subsequent step of drying the concentrated extract. Even though some of the volatile components which are removed with the water during the concentration step above can be recovered such as by partial condensation or by other processes known to those skilled in the art, and thus can be reincorporated into the concentrated extracts prior to drying, the relative proportions of key volatile and aroma components are inevitably altered under commercial processing conditions and the flavor and aroma of the resulting

extract is not very satisfactory. Another problem is encountered during the drying operation mentioned above since here again key volatile and aroma components are either lost or altered. Necessarily, the losses suffered by each of the components differs depending upon processing conditions, i.e., spray drying, freeze drying, percent solids in the extract, etc.

## SUMMARY OF THE INVENTION

The present invention provides a method for enhancing the flavor and aroma of a final tea beverage prepared from a soluble tea which comprises adding an amount of flavoring agent to the soluble tea sufficient to produce a final tea beverage having therein an added flavoring agent in a flavor-enhancing amount, preferably about 0.01-25 ppm, most preferably about 0.1-5 ppm; said flavoring agent consisting essentially of about 5-68% of at least one compound selected from the group consisting of linalool and linalool oxide, preferably about 3-56% linalool and about 2-16% linalool oxide, about 0-15% trans-2-hexenal, about 0-11% 1-penten-3-ol, about 0-8% trans-2-hexen-1-ol, about 2-16% cis-3-hexen-1-ol, about 0-21% iso-butanal, about 0-25% 2-methylbutanal, about 0-17% propanal, about 0-10% pentanal, about 0-6% hexanal, about 0-46% acetaldehyde, about 0-16% phenylacetaldehyde, about 0-5% methyl salicylate, about 0-4% (preferably at least about 0.7%) n-hexanol, about 0-2% ethyl acetate, about 0-0.6% alpha-terpineol, about 0-0.6% nerolidol, about 0-0.3% beta-ionone, about 0-0.3% iso-jasmone, about 0-0.7% benzaldehyde, about 0-2% n-pentanol, about 0-1% n-octanol, about 0-0.7% geraniol, about 0-3% iso-butanol, about 0-0.3% iso-propanol, about 0-8% n-butanol, about 0-1% phenylethanol, about 0-5% propionic acid, about 0-1% iso-butyric acid, about 0-1.2% n-butyric acid, about 0-4% iso-valeric acid, about 0-4% n-valeric acid, about 0-0.6% 2-methylvaleric acid, about 0-0.06% iso-hexanoic acid, about 0-19% n-hexanoic acid, about 0-10% cis-3-hexanoic acid, about 0-10% trans-2-hexanoic acid and about 0-4% cis-2-penten-1-ol.

Suitably, said flavoring agent consists essentially of about 5-68% of at least one compound selected from a group consisting of linalool and linalool oxide, preferably about 3-56% linalool and about 2-16% linalool oxide, about 0-15% trans-2-hexenal, about 1-11% 1-penten-3-ol, about 0-8% trans-2-hexen-1-ol, about 2-16% cis-3-hexen-1-ol, about 0-21% iso-butanal, about 0-25% 2-methylbutanal, about 0-17% propanal, about 0-10% pentanal, about 0-6% hexanal, about 0-46% acetaldehyde, about 0-16% phenylacetaldehyde, about 0-5% methyl salicylate, about 0-4% n-hexanol, about 0-2% ethyl acetate, about 0-0.6% alpha-terpineol, about 0-0.6% nerolidol, about 0-0.3% beta-ionone, about 0-0.3% iso-jasmone, about 0-0.4% benzaldehyde, about 0-2% n-pentanol, about 0-1% n-octanol, about 0.4-0.7% geraniol, about 0-3% iso-butanol, about 0-0.3% iso-propanol, about 0-1% n-butanol and about 0-1% phenylethanol.

In one preferred embodiment said soluble tea is a coldwater soluble tea and said flavoring agent consists essentially of about 18-27% linalool, about 10-16% linalool oxide, about 7-15% trans-2-hexenal, about 4-8% 1-penten-3-ol, about 2-4% trans-2-hexen-1-ol, about 5-9% cis-3-hexen-1-ol, about 1-4% isobutanal, about 1-5% 2-methylbutanal, about 1-3% propanal, about 6-10% pentanal, about 1-3% hexenal, about



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## UNITED STATES PATENT OFFICE

2,476,072

## METHOD OF MAKING A TEA EXTRACT

Donald K. Tressler, Westport, Conn.

No Drawing. Application June 7, 1946,  
Serial No. 675,311

3 Claims. (Cl. 99-77)

1

This invention concerns the preparation of a concentrated tea extract which can be prepared and stored, and employed by simple dilution to provide a beverage with the flavor and taste of a fresh brew.

Many proposals have been made for preparing tea extracts, but with the disadvantages of loss of flavor components, presence of excessive tannins, or presence of undesirable foreign matters.

For foodstuffs, no material foreign to the normal product should be present. To avoid expensive and complicated procedures of later removal, contacts with such foreign material should be avoided. Thus, the employment in preparing aromatic tea extracts, as heretofore proposed, of organic solvents such as acetone, petroleum ether, pentane, toluene, chloroform, carbon tetrachloride, ether, or alcohols, requires later separation of these; and such separation is difficult because volatile aromatic constituents of tea have volatilization points concurrent with those of such solvents so that fractionating distillation or condensation represents loss of the volatile aromatics which it is being sought to preserve in the extract.

In other previously proposed procedures, extractions have been described, with treatment of the extract by separative or purifying chemicals such as quick lime, calcium hydroxide, lead acetate or ferric chloride; but here also it is obvious that the introduced chemicals introduce conditions foreign to the normal brew and in some instances provide components injurious to health, and their final exclusion from the extract is necessary.

Tea as a beverage consists essentially of a water solution of water-soluble components, as is demonstrated by the absence of an oily layer at the surface of the brew. Brewed tea has flavor and taste characteristics. The flavor or odor characteristics, perceived by the olfactory senses, are largely due to volatile aromatic components; while the so-called taste characteristics of body, tannins, sweetness, are largely due to non-volatiles. In addition, caffeine, thein, and like drug components are largely present as non-volatiles.

In the usual preparation of tea by steeping with hot water, it has been considered that a long time of contact of water and tea leads to the production of a bitter extract, and that this bitterness can be avoided by separating the tea before the "bitter principle" has been extracted. I have found, however, that by firstly recovering the volatile components, the later exposure for water extraction and concentration may be extended

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without producing bitterness in the rehydrated product.

Owing to the high volatility of the aroma of the tea and the relatively low solubility of the astringent flavoring components, the preparation of a tea concentrate is more complicated and difficult than the making of other beverage concentrates. If the concentrate is to be used in the making of either iced or hot tea, the difficulties are multiplied owing to the necessity of producing a concentrate which is easily soluble in both hot and cold water.

I have discovered a process of obtaining a concentrate which when mixed with hot water instantaneously produces hot tea which cannot be distinguished from tea freshly brewed by the conventional methods: Similarly, if iced water is mixed with the tea concentrate, excellent iced tea is produced. Obviously such a product has commercial value, since the use of such a concentrate greatly simplifies the making of both hot and cold tea.

I have found that two groups of brewed tea components, i. e. volatiles and non-volatiles, can be separately collected, wherewith the volatiles can be recovered in the form of an aqueous liquid, while the non-volatiles can be recovered in the form of a water-solution which readily lends itself to concentration without loss of valuable components. The two separate extracts or concentrates can then be joined as a composite extract having the components which upon later dilution excite the senses of smell and taste in the same manner as a freshly-prepared brew.

Briefly, the steps used in making the concentrate are the following: Tea, either with or without the addition of water, is subjected to steam distillation. A steam distillate is collected in quantity to hold the volatiles and to permit the remixing with the concentrated water extract. In practice, the weight of this steam distillate is 10 percent or more compared to the dry weight of the tea; the maximum for tea concentration is around 300 percent, a preferred range being around 45 and 50 percent, at which the remixure of steam distillate and concentrated water extract is easy, and the dilution of the mixture does not demand a far-driven concentration of the water extract. The total quantity of water to be left in the mixture, comprising the water condensed with the steam distillate and the residual water of the concentrated water extract, can be determined from the requirements of reduced bulk and weight of the product, the temperature conditions of remixing, the probable exposure of an opened container before the contents are con-

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sumed, the protective additives, etc. In general, if the product is to be opened and kept in a warm place, the water content should be high for better retention of aromatic volatile constituents; if the mixing of steam distillate and water-extract concentrate is at a high temperature level (e. g. 150 degrees F.), then a larger part of the total water can come from the steam condensate: when additives are used to prevent coarse granular crystallization of tannins, etc., then the amounts of water captured in the steam condensation and remaining in the concentration can each be held low so that a solid concentrate is produced. This steam distillate contains nearly all of the volatile flavoring components of the tea. The tea leaves are then extracted with water in quantity from one to twenty times the original weight of the tea, near the boiling point. The water extract is then evaporated in vacuo, preferably using 25 to 29 inches of vacuum, until the weight of the concentrate remaining is only one-half to three-fourths of the original weight of the tea used. Usually the water extracts are condensed to about 6 to 10 percent of the original weight of the extract. This heavy concentrated extract, which is rich in the non-volatile flavoring components of the tea (tannins, etc.) is mixed while still warm with the steam distillate previously obtained from the tea.

This product may be used as a concentrate without further treatment, but with highly concentrated conditions, the tannin and other slightly soluble components precipitate out and settle as a sludge which, although it dissolves readily in boiling water, is not easily and quickly soluble in cold water. I have found that the difficultly soluble components may be kept in a much more readily soluble colloidal form by either the addition of a small amount of a suitable non-toxic protective colloid which itself is preferably a component that is accepted for normal employment in other food products (e. g. either regular pectin or low methoxyl pectin may be used), or a relatively large amount of sugar or corn syrup. In either case the protective colloid or the sugar should be added to the warm tea concentrate which should then be stirred until the added substance has dissolved. The addition of sugar produces a smoother, more perfect solution which is desirable if there is no objection to the sweetness. Either the protective colloid or the sugar gives a product satisfactory for use in either hot or cold tea.

The use of sugar possesses another advantage since it increases the concentration of the product to the point where it does not ferment quickly after a jar of the product has been opened.

If sugar is not used and the product is not pasteurized, less steam distillate should be used so that the soluble solids content of the concentrate will be at least 25 percent, otherwise the product must be held under refrigeration to prevent very rapid spoilage by microorganisms.

Regardless of whether or not the product is sweetened with sugar, the concentrate should preferably be pasteurized, heat processed or sterilized to obtain a concentrate which may be kept for long periods. This may be carried out by heating the concentrate to 160° F., then filling into bottles, jars, cans or other containers, immediately closing hermetically the containers and inverting or placing the hot containers on their sides. Care must be taken to fill each container completely to avoid mold growth.

Another method of pasteurization is to fill the

cool or warm product into containers, allowing headspace for expansion, then closing hermetically and processing them in a boiling water bath for a few minutes.

#### Example 1

The following is an example of the preferred method of making the sweetened concentrate.

100 g. Fine Broken Ceylon tea was subjected to "steam distillation" in dry form until 98 to 100 g. of distillate was obtained. In conducting the "steam distillation" the distilling flask was surrounded by boiling water and steam passed in rapidly, the entire operation required about five minutes. The major part of the aromatic components distill off rapidly as soon as the distillation flask and its contents are hot. The receiver was surrounded with ice cubes and the tube from the condenser led to the bottom of the receiving flask.

After the steam distillation had been completed, the tea was emptied into an earthenware vessel, using boiling distilled water to rinse the flask and remove all the tea. The total amount of boiling distilled water used for the first extraction was 700 ml. The earthenware vessel was placed in a boiling water bath and the tea was stirred at thirty second intervals for five minutes. Then the extract was poured through a strainer. The tea grounds were emptied into a double cheesecloth and lightly pressed, after which the grounds were returned to the vessel and extracted for three minutes with 300 ml. boiling distilled water. The tea extract was again decanted, and the tea grounds lightly pressed in the same double thickness cheesecloth. Again the grounds were returned to the vessel and finally extracted for two minutes with 200 ml. boiling distilled water. The extract was decanted and the tea grounds lightly pressed as before. The first extraction takes most of the soluble color matters. The major part of the total water extraction came with the first two waters; the total extract represented about 75 to 80 percent of the soluble solids which are extracted. The extractions and pressings were within a total time not exceeding 15 minutes but this time was not critical. All extracts were combined (including the pressings) and kept hot; 840 ml. extract was obtained. The hot extract was immediately strained through a double thickness of fine muslin, thereby removing much insoluble material which might cause the concentrate to be muddy. The extract was placed in a 3-liter distilling flask, which was in turn placed in a boiling water bath (on an electric hot plate) and evaporated in vacuo (27 to 28 inches) until the amount remaining in the flask was reduced to 65 to 70 grams. This concentrate was poured out and the flask was rinsed out with a little of the steam distillate. It is necessary to use the added distillate in warm condition, (but preferably below 150 degrees F.,) so that the otherwise insoluble tannin will be kept in solution during the mixing. It is also necessary to rinse out the flask a second time. The combined weight of the steam distillate and the concentrate was about 165 to 175 g., and had a "solids" content of about 15 to 16 percent. To this was added 270 g. granulated sugar and the mixture warmed slightly and stirred until the sugar had dissolved. The total "solids" content was 65.5 to 66 percent, essentially 60 percent being the added sugar.

The product was pasteurized by heating to 180 degrees F. in the inner compartment of a double boiler. When this temperature was reached the

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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific information required.

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the situation.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what is to be achieved and provides a clear direction for the team.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources and timeline needed to complete them.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves comparing the actual outcomes with the objectives and goals to determine the effectiveness of the project and identify areas for improvement.

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1. The first of these is the fact that the  
2. Government has been unable to secure  
3. the necessary funds to carry out its  
4. policy of non-interference in the  
5. internal affairs of the country.  
6. This has been due to a variety of  
7. factors, including the fact that the  
8. Government has been unable to secure  
9. the necessary funds to carry out its  
10. policy of non-interference in the  
11. internal affairs of the country.

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1. The first of these is the fact that the majority of the population of the United States is of European descent. This is a fact which has been recognized by the government and the people of the United States for many years. It is a fact which has been recognized by the government and the people of the United States for many years.

It is a fact that the majority of the population of the United States is of European descent. The majority of the population of the United States is of European descent. The majority of the population of the United States is of European descent.

# United States Patent Office

3,689,278

Patented Sept. 5, 1972

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## 3,689,278 TEA PROCESS

Robert J. Carbonell, Stamford, Conn., assignor to Standard Brands Incorporated, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 707,366, Feb. 7, 1968. This application Oct. 21, 1970, Ser. No. 82,801

The portion of the term of the patent subsequent to Feb. 7, 1985, has been disclaimed

Int. Cl. A23f 3/02

U.S. Cl. 99—77

5 Claims

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### ABSTRACT OF THE DISCLOSURE

A method of preparing tea concentrates which when reconstituted in hot water have improved flavor and aroma characteristics comprising subjecting tea to a flavor and aroma extraction process and collecting flavor and aroma constituents, mixing the constituents with soluble tea solids to provide an aqueous mixture having a solids concentration of above about 20 percent by weight, freeze drying the mixture and mixing it with a spray dried instant tea.

This application is a continuation-in-part of application Ser. No. 707,366 filed Feb. 7, 1968, now Pat. No. 3,554,761.

This invention relates to an improved method of preparing dry, water soluble tea concentrates which when reconstituted in hot water have substantially the flavor and the aroma of freshly brewed tea.

Many attempts have been made in the past to produce dry water soluble tea concentrates, hereinafter referred to as "instant tea," which when reconstituted in hot water have substantially the flavor and aroma of freshly brewed tea.

Two general approaches have been taken to prepare instant tea. The first, and the one principally being used, involves extracting tea leaf with hot water and then drying the extract by the application of heat, for instance by spray drying. Spray drying is usually carried out at relatively high temperatures. Due to the high temperatures employed, many of the desired volatile aroma and flavor constituents of the tea extract are lost and, in some instances, caramel-like flavors are imparted to the dried tea.

The other general approach which has been taken to produce an instant tea is to freeze dry a tea extract. Freeze dried instant tea is generally considered to be superior in flavor and aroma to spray dried tea and is quite similar to freshly brewed tea in terms of flavor quality. This is due to the absence of caramel-like flavors typical of tea which has been dried at relatively high temperatures and also because lesser amounts of the volatile and flavor constituents contained in the extract are lost during drying because of the low temperatures employed. However, even though freeze drying provides the advantage of producing an instant tea which is more similar to freshly brewed tea than is spray dried tea, there are significant economic disadvantages associated therewith. These include the expensive equipment necessary to carry out freeze drying, the maintenance thereof, low productivity rates due to the slow rate of sublimation of the ice from the frozen tea extract, and the relatively large amount of energy required to carry out freeze drying.

It is the principal object of the present invention to provide a method of producing an instant tea which when reconstituted in hot water has improved aroma and flavor characteristics.

This object, and other objects of the present invention which will be apparent from the following, are obtained by providing a distillate of flavor and aroma constituents of tea, collecting the distillate at a temperature in the

range of from about 35° to about 212° F., mixing the distillate with soluble tea solids, at least a portion of which is spray dried tea, to provide an aqueous mixture having a tea solids concentration of above about 20 percent by weight, freeze drying the aqueous mixture and mixing the freeze dried mixture with spray dried instant tea to obtain a level of the freeze dried mixture of from about 2.5 to about 8 percent by weight.

The distillate of flavor and aroma constituents of tea may be provided by a variety of methods. For instance, dried tea leaf may be subjected to steam distillation using either wet or dry steam or an aqueous extract of tea may be "stripped" to provide a distillate. Stripping tea extract may be accomplished by the use of an evaporator, or by passing tea extract through a distillation column such as a packed column into which steam or other suitable gases are countercurrently passed, or by any other conventional method. The preferred mode of acquiring the distillate is by stripping an aqueous extract of tea.

Dried tea leaf may be subjected to distillation conditions while it is in a column or while it is in a agitated bed, for instance, in a screw conveyor. When the tea is in a column, the tea may be wetted prior to its being subjected to distillation conditions. Under these conditions, when steaming is initiated the steam initially contacts the admixture of tea and water and causes percolation and refluxing which strips the volatile flavor and aroma constituents of the tea.

The distillates are collected or condensed at a temperature in the range of from about 35° to about 212° F. At these collection temperatures the desirable aroma and flavor constituents of tea are obtained. If desired these collected distillates may be subjected to another distillation step to provide a distillate having a greater concentration of aroma and flavor constituents.

The collected distillates or condensates are mixed with soluble tea solids, at least a portion of which is spray dried tea, to provide an aqueous mixture having a soluble tea solids concentration of at least 20 percent. Preferably, however, the soluble tea solids concentration in the aqueous mixture is from about 20 to about 45 percent by weight.

Although the total soluble tea solids in the aqueous mixture may be provided by spray dried tea, a portion of the solids may be provided by mixing suitable proportions of spray dried tea and freeze concentrated tea extract. The freeze concentrated tea extract may be prepared by methods known in the art.

After the mixture of distillates and soluble tea solids is prepared, the mixture is frozen and freeze dried by methods known in the art. Since this freeze dried mixture is used at low levels, there is no requirement that careful control of the freezing conditions be maintained such as would be required in preparing a "total" freeze dried tea where powder color and bulk densities must be carefully controlled. This permits the use of any conventional freezing technique, such as tray freezing, blast freezing, belt freezing etc.

The frozen material may be freeze dried in slab or particulated form. This freeze dried material is then incorporated into spray dried instant tea at levels of from about 2.5 to about 8 percent by weight.

In order to more clearly describe the nature of the present invention, a specific example will hereinafter be described. It should be understood, however, that this is done solely by way of example, and is intended neither to delineate the scope of the invention nor limit the ambit of the appended claims.

#### Example 1

Dried tea leaf was introduced into a vented extractor and extracted with water at a temperature of about 212° F. After extraction, the extract was centrifuged to re-

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