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(54) Title: ALCOHOLIC BEVERAGE CONTAINER AND METHOD OF PRODUCTION AND PACKAGING THEREOF

(57) Abstract

A sealed plastics container (1) for holding an alcoholic beverage such as wine, the container comprising: a receptacle (2) for containing the alcoholic beverage therein and which includes a peripheral flange (8) about the mouth of the receptacle, a biocompatible inner surface and a wall having a low gas transmissibility property, a sealing membrane (6) detachably fixed to said flange and including a biocompatible inner surface, a headspace between the alcohol and the biocompatible inner surface of the sealing membrane and containing a biocompatible gas other than oxygen, wherein the membrane seals the alcoholic beverage from contact with air. A support member for releasably supporting a plastics receptacle and a method for packaging an alcoholic beverage in a container are also disclosed.
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ALCOHOLIC BEVERAGE CONTAINER AND METHOD OF PRODUCTION
AND PACKAGING THEREOF

The present invention relates to beverage containers particularly sealed containers but
more particularly relates to a sealed ready to use alcoholic beverage container and a
method of production of a wine filled container and packaging thereof.

Containers for liquid beverages have in the past been manufactured in a wide variety of
forms whereby greater use has been made of soft packaging formed from plastics or fibre
materials as an alternative to use of glass. One such package is manufactured from
cardboard including a layer of plastics material and a metallic layer and comprises a box
like receptacle with a small opening through which a straw passes to gain access to the
beverage. The opening has a frangible sealing membrane across it which keeps the
contents airtight and which must be invaded to gain access to the inside of the container.

This class of containers is generally used for soft drinks and although they have
previously been used for holding alcoholic beverages, as consumers of the latter are
discerning in their acceptance of containers from which they partake of alcohol, such
containers have not gained market acceptance. There is consumer resistance to alcoholic
beverages dispensed from such containers. Another known sealed airtight container for
liquid beverages comprises a receptacle, formed from a plastics material and having a
heat sealed membrane or cover which ensures the package is air tight. The membrane
generally comprises a sheet of aluminium foil which engages a peripheral flange formed
on the receptacle. This class of containers has previously been used for non-alcoholic
liquid beverages such as soft drinks, particularly juices and long life milk. Access to the
contents is gained by simply peeling off the aluminium foil away from the flange to which
it is sealed. It has not hitherto previously been known to package alcoholic beverages in
such containers and to do so requires special techniques in the production of the product
to ensure that the alcoholic beverage is not oxidised or otherwise degraded.

Furthermore, it is necessary to select the appropriate plastics material for the container
and to ensure that a headspace gas is provided in the container which gas helps prolong
the shelf life of the contents at least for up to six months.
Alcoholic beverages have in the past been packaged in bottles, casks, satchels and cans. Wine products have to date been served in large and small bottles or in collapsible casks. Where serving elegance is a consideration, bottles or glasses are the preferred containers with the former providing multiple serves and the latter providing a single serve. There are some circumstances where alcoholic beverages are in single serve demand such as in bars or restaurants or in flight. In these circumstances, it can be inconvenient and time consuming for an attendant to fill consumers’ glasses. It is very common for self contained sealed containers of soft drinks and juices to be served quickly in these situations due to the availability of single serve sealed packages for these products.

However, this is not the case with alcoholic beverages particularly wine and particularly where a single serve only is required, as these beverages have not hitherto previously been packaged in plastics in a self contained sealed convenient ready to use form.

Packaging alcohol in plastic containers has traditionally been considered undesirable by suppliers of alcohol products. Consumable liquids such as soft drinks previously and presently packaged in plastics containers have a short shelf life and must be used soon after packaging. As plastics are known to allow gas transmissibility therethrough, the contents of a plastics container are prone to oxidation soon after packaging, i.e. within days or over a few weeks. Despite the inherent difficulties in the use of plastics for liquid beverages, the present invention has overcome the problem to the extent that the shelf life of an alcoholic beverage stored in a plastics container may be prolonged for at least six months without compromise to the integrity of the alcoholic contents. In order to successfully package alcohol in plastics containers for the consumer market it was necessary to address the problem of gas transmissibility through the plastics material and to develop a production process whereby unwanted gases in and around the alcoholic beverage could be purged before sealing the plastics container. No thin walled plastics containers are totally impermeable to gases but it was found that permeability could be dramatically reduced if an appropriate selection of plastics material was made. This, in combination with the method of production of the finished container results in an alcoholic beverage free of problems such as oxidation for a period of up to and conceivably beyond 6 months. A suitable plastics receptacle for holding alcohol may comprise a single layer or multiple layers of plastics. Preferably, the inside surface of the
receptacle is biocompatible as is the inner surface of the membrane which seals the receptacle.

The present invention provides an alternative plastics container for use in the service of alcoholic beverages and also provides a method enabling the container to be used for the service of alcohol and resulting in a longer shelf life than liquid products traditionally served in plastics.

In the broadest form of the apparatus aspect, the present invention comprises;

a sealed plastics container for holding an alcoholic beverage such as wine, the container comprising;
a receptacle for containing the alcoholic beverage therein and which includes a peripheral flange about the mouth of the receptacle, a biocompatible inner surface and a wall having low gas transmissibility;
a sealing membrane detachably fixed to said flange and including a biocompatible inner surface,
a headspace between the alcohol and the biocompatible inner surface of the sealing membrane and containing a biocompatible gas other than oxygen, wherein the membrane seals the alcoholic beverage from contact with air.

According to a preferred embodiment, the invention comprises a self contained sealed container for containing a single serve of wine, wherein the container comprises, a plastics receptacle having the appearance of a carafe, drinking glass or the like and a membrane sealing the contents therein. Preferably, a headspace is formed between the beverage and the biocompatible inner surface of the membrane which headspace contains a biocompatible gas such as but not limited to Nitrogen or Carbon Dioxide. According to the preferred embodiment, the receptacle is produced in a mould and formed from a transparent or opaque plastics material such as but not limited to polypropylene. Other materials which could be used are polystyrene and polyethylene. The receptacle has properties which minimise oxygen transmissibility carbon dioxide transmissibility and render the receptacle alcohol tolerant. Alternatively, the receptacle may be formed of multiple layers with at least the inner layer comprising a biocompatible plastics material
such as virgin (i.e. not recycled) polypropylene and has the appearance of a glass or the like suitable for drinking wine in single serves. Alternatively, the inner layer may be polyethylene.

5 Alternatively, the receptacle is formed from a plurality of layers of material having low gas transmissibility from the external environment and low leeching capability from the internal environment to the outside of the receptacle such that gas entrained in the wine or other alcoholic beverage or in the headspace of the receptacle will be prevented from escaping.

10 According to one broad form of the method aspect, the present invention comprises, a method of production of a sealed container for holding an alcoholic beverage as hereinbefore described, comprising the steps of:

(a) taking a plastics receptacle having a biocompatible inner surface and a wall having a low gas transmissibility property suitable for holding the alcoholic beverage therein and with an open mouth having a peripheral flange thereabout,

(b) taking a membrane having at least one layer with or formed from a biologically, electrically and/or chemically inert or non reactive substance or material,

(c) filling the receptacle with an alcoholic beverage such as wine,

(d) introducing gaseous nitrogen or other suitable food grade gas into the receptacle under positive pressure and in a controlled environment to displace residual oxygen remaining in the receptacle,

(e) placing the membrane over the open mouth so that said non-reactive material layer is on the inside and so that it engages with the peripheral flange,

(f) heating the membrane or heating the receptacle so that an adhesive on the membrane melts onto the flange causing the membrane to air-tight seal the mouth of the receptacle.
According to a preferred embodiment, before the filling step takes place the receptacle is purged of oxygen.

According to another form of the method aspect the present invention comprises; a method for producing a sealed plastics container for an alcoholic beverage such as wine comprising the steps of;

a) taking a plastics receptacle formed from a plastics material,
b) introducing an alcoholic beverage into the receptacle,
c) displacing residual oxygen from the receptacle by introducing gaseous Carbon Dioxide, Nitrogen or a mixture of both in predetermined proportions or other suitable food grade gas into the receptacle,
d) applying a membrane to the open mouth of the receptacle so that the membrane adheres by heat sealing to a peripheral flange formed around the open mouth of the receptacle to thereby provide an airtight seal.

In another broad form of the method aspect the present invention comprises;
a method for packaging an alcoholic beverage in a container as hereinbefore described comprising the steps of;

a) taking a plastics receptacle suitable for holding an alcoholic beverage and having an open mouth with a peripheral flange thereabout and also having a biocompatible inner surface and a wall with a low gas transmissibility coefficient;
b) introducing into the receptacle an alcoholic beverage such as wine modified for use in a plastics container, leaving a headspace between the surface of the beverage and the mouth,
c) introducing the receptacle into a controlled environment pressurised to enable evacuation of air from the headspace of the receptacle and the surrounding space within the controlled environment;
d) substituting displaced air with a biocompatible gas introduced under positive pressure within the controlled environment,
e) applying a sealing membrane to the peripheral flange of the receptacle to trap said biocompatible gas in the headspace formed therein and whilst the surrounding environment is under positive pressure;
f) removing the receptacle from the controlled environment.

According to one embodiment, the container comprises a transparent or opaque plastics receptacle which has high resistance to transmission of gases such as oxygen and which has a membrane of aluminium placed across the open mouth to create a seal. The adhesive is applied to the membrane either as a coating formed from the biologically, electrically and/or chemically inert or non reactive substance or in addition to that substance as an additional layer about the periphery of the membrane. The sealing membrane is attached by heat sealing.

In a preferred embodiment of the method aspect the wine is modified to ensure that it comprises constituents within predetermined ranges, namely:

- SO₂ (Sulphur Dioxide) - 30 to 40 ppm
- Dissolved O₂-Oxygen - less than 1.5mg per litre
- Dissolved CO₂-Carbon Dioxide - 0.4 to 0.8 grams per litre
- Ascorbic Acid - Adjustable

This facilitates the selection of the appropriate biocompatible gas for use in the headspace and ensures that the wine is compatible with the environment within the receptacle once the production method is complete and when the wine is packaged.

According to an alternative embodiment of the method aspect of the invention, the container may be completed by the additional steps of adding a plastic lid over the membrane for re-use of the container once the membrane is removed. Also, the metallic membrane may be pre-heated prior to fixing to the flange of the container with the pre-heating melting a glue or glue like substance either on the flange or on the inner surface of the sealing membrane.
According to another aspect, the present invention comprises:
a method of packaging sealed containers for holding an alcoholic beverage as
hereinbefore described comprising the steps of;

a) taking a carton of a predetermined size;
b) introducing into the container an air tight liner material which may
substantially conform to the internal contour of said carton and which
forms a packaging envelope;
c) placing in the envelope a predetermined number of the sealed packing
containers containing an alcoholic beverage therein;
d) evacuating residual air within the envelope and substituting a
biocompatible gas within the envelope;
e) sealing the envelope to trap the biocompatible gas therein; and
f) sealing the carton.

The present invention will now be described in more detail according to a preferred but
non limiting embodiment and with reference to the accompanying illustrations wherein;

Figure 1: shows a container for holding an alcoholic beverage according to a
preferred embodiment of the invention;

Figure 2: shows the container of figure 1 with the sealing membrane peeled away
from the peripheral flange around the open mouth of the receptacle;

Figure 3: shows the container of figure 1 with a sealing cover;

Figure 4: shows a schematic view of a multi layer arrangement for the receptacle
according to a preferred embodiment;

Figure 5: shows an exploded view of a beverage container according to an
alternative embodiment of the invention;

Figure 6: shows the container of figure 5 with the receptacle located in its base; and

Figure 7: shows a table of properties of various plastics materials.

Referring to figures 1 and 2 there is shown according to a preferred embodiment of the
invention a container 1 for alcoholic beverages. Container 1 comprises a plastics
receptacle 2 which may assume the general shape of a wine glass for holding an alcoholic
beverage. The receptacle may have the appearance of a conventional glass receptacle
such as a tumbler or other glass shaped receptacles used for serving alcoholic beverages
and also including carafes and the like. To enhance the appearance of receptacle 2 as a
suitable container from which wine may be directly consumed, the receptacle is adapted
with a base 3 which is connected to the underside 4 of receptacle 2 via stem 5.
Receptacle 2 is sealed prior to use and in order to facilitate said sealing a membrane 6
covers the open mouth 7 of receptacle 2. In order to enable effective air tight sealing, a
peripheral flange 8 (see figure 2) is moulded into the receptacle. The upper surface 9 of
flange 8 provides a surface which receives and enables bonding thereto of the membrane
6. Membrane 6 also has a second layer comprising a biocompatible coating which
isolates the contents of the receptacle 2 from the primary membrane material.
Preferably, the membrane material is thin aluminium sheet coated on the inside face with
a layer of chemically, electrically and biologically inert material and preferably a selected
polymer such as polypropylene.

Figure 4 shows one possible embodiment of the constituents of a multi layer plastics
walled container.

As shown schematically in figure 4 receptacle 2 may be of multi layer construction
formed from an inner layer 12 of virgin polypropylene. However, the receptacle may be
formed from a single layer of plastics material such as but not limited to modified nylon.
Layer 13 comprises scrap polypropylene as this will not come in contact with the
alcoholic beverage. Scrap polypropylene layer 13 is in apposition with adhesive layer 14
which in turn is in apposition with EVOH core layer 15. An adhesive layer 16 overlies
layer 15 and is itself overlain by layer 17 which comprises scrap polypropylene.

The layered receptacle 2 must be impermeable to oxygen absorption and to carbon
dioxide leeching to ensure that the alcoholic beverage does not undergo oxidation or
other form of degradation. This is achieved by careful selection of the plastics material
used in the multi layered or single layer receptacle wall. According to one embodiment,
layer 17 of receptacle 2 is mixed with a preselected colourant.
In use, sealing membrane 6 is simply peeled away from flange 8 to gain access to the contents of the receptacle as shown in figure 2.

Figure 5 shows an exploded view of an alternative embodiment of the apparatus aspect of the invention. The container shown comprises receptacle 20 which seats in preformed support member 21. Receptacle 20 comprises an internal peripheral rib 22 which engages a corresponding rib 23 in support member 21. This enables receptacle 20 to click in and click out of support member 21 (see figure 6). Alternatively, receptacle 20 may be glued to support member 21 in which case corresponding ribs 22 and 23 provide a key securing receptacle 20 to support member 21.

Support member 21 comprises stem 24, base 25 and recess 26. Figure 6 shows receptacle 20 seated in recess 26. The lower portion of the receptacle 20 is contoured to conform to the shape of the contour of recess 26.

According to a preferred embodiment of the method aspect, container 1 is produced according to the following regime. The first step is to produce the receptacle 2 and this is effected by moulding polypropylene (or other suitable material through which oxygen cannot penetrate) to ensure that the integrity of the sealing of the contents is maintained and thus to ensure that oxidisation of the liquid beverage does not take place.

Preferably, receptacle 2 is moulded into the shape of a glass. To satisfy consumer preference for containers of alcoholic beverages. Each receptacle 2 is set in position on a production line where it is filled via dispensers with the selected alcoholic beverage which may be white or red wine, beer or any other alcoholic beverage. On the inner surface of the aluminium membrane is a biocompatible lacquer layer or layer formed from a material which performs the roles of isolating the contents of the receptacle 2 from the aluminium, and providing a sealing material which melts under the sealing process.

During or moments after the preheating any residual oxygen is evacuated from the receptacle by injection of gaseous nitrogen or other suitable food grade gas into the void
above the contents. The membrane is presented to the peripheral flange 8 immediately
the evacuation has been completed thereby effecting sealing of the contents. To ensure
that the headspace between the membrane and the alcoholic beverage is purged of
unwanted oxygen the receptacles are sealed in a controlled environment.

To consume the contents, the user simply pulls tab 10 of membrane 6 away from flange 8
as shown in figure 2. Figure 3 shows a cover 11 detached from the container of figure 1.
Receptacle 2 can be resealed where necessary by the removable cover 11 which engages
the peripheral flange 8. Cover 11 can also be used to cover and protect membrane 6
prior to use.

The selection of an appropriate combination of plastics when a multi-layered receptacle
is required and the selection of a suitable plastic for a single layer receptacle is made with
reference to the behaviour and a number of properties of the selected plastics materials.
These include clarity flexural modulus, impact strength density oxygen transmissibility
and carbon dioxide transmissibility.

The table in Figure 7 shows a comparison of parameters for various plastics materials.

It will be recognised by persons skilled in the art that numerous variations and
modifications can be made to the invention as broadly described herein such as but not
limited to changing the order of the method steps and/or altering the materials of
construction of the container without departing from the overall spirit and scope of the
invention.
THE CLAIMS:

1. A sealed plastics container for holding an alcoholic beverage such as wine; the container comprising,
a receptacle for containing the alcoholic beverage therein and which includes a peripheral flange about the mouth of the receptacle, a biocompatible inner surface and a wall having a low gas transmissibility property,
a sealing membrane detachably fixed to said flange and including a biocompatible inner surface,
a headspace between the alcohol and the biocompatible inner surface of the sealing membrane which contains a biocompatible gas other than oxygen,
wherein the membrane seals the alcoholic beverage from contact with air.

2. A receptacle according to claim 1 wherein the receptacle wall is formed from multiple layers of selected plastics materials or a single layer of plastics material.

3. A container according to claim 2 wherein the sealing membrane may be peeled away from the peripheral flange to expose the alcoholic beverage.

4. A container according to claim 3 wherein the sealing membrane comprises a composite of aluminium forming an outer layer and a plastics material forming a biocompatible inner layer.

5. A container according to claim 4 wherein the receptacle is formed from multiple layers of plastics material wherein a first biocompatible inner layer comprises virgin polypropylene.

6. A container according to claim 5 wherein the multiple layers of plastics comprise:
an inner layer of virgin polypropylene a first layer of scrap polypropylene, an EVOH core layer; and a second layer of scrap polypropylene.
7. A container according to claim 4 wherein the single layer comprises a food grade inert plastics material.

8. A container according to claims 6 or 7 wherein the receptacle has associated therewith a support member including a base member and stem which imparts a wine glass like appearance to the container, wherein the receptacle is integral with the support member.

9. A container according to claims 6 or 7 wherein the receptacle is adapted to engage a separate support member comprising a stem and base member which in combination with the receptacle imparts to the container a wine glass like appearance.

10. A container according to claim 9 wherein said base member is connected to one end of the stem and at the other end of said stem there is a recessed portion having a contour which generally conforms to the contour of the receptacle.

11. A container according to claim 10 wherein the support member includes at least one circumferential rib in the recessed portion which engages a corresponding circumferential rib on the receptacle enabling the base and receptacle to snap fit together.

12. A container according to claim 11 wherein the receptacle and base may be glued together.

13. A container according to claim 12 further comprising a detachable closure which engages the peripheral flange and enables the container to be temporarily sealed after the sealing membrane is removed.

14. A support member for releasably supporting a plastics receptacle as hereinbefore described for holding an alcoholic beverage, the support member comprising a stem having at one end a base member and at its other end a recess for receiving said plastics receptacle.
15. A support member according to claim 14f wherein the receptacle and support member together assume a wine glass like appearance.

16. A method for packaging an alcoholic beverage in a container as hereinbefore described comprising the steps of,
   (a) taking a plastics receptacle having a biocompatible inner surface and a wall having a low gas transmissibility property suitable for holding the alcoholic beverage therein and with an open mouth having a peripheral flange thereabout,
   (b) taking a membrane having at least one layer with or formed from a biologically, electrically and/or chemically inert or nonreactive substance or material,
   (c) filling the receptacle with an alcoholic beverage such as wine,
   (d) introducing gaseous nitrogen or other suitable food grade gas into the receptacle under positive pressure and in a controlled environment to displace residual oxygen remaining in the receptacle,
   (e) placing the membrane over the open mouth so that said non-reactive material layer is on the inside and so that it engages with the peripheral flange,
   (f) heating the membrane or heating the receptacle so that an adhesive melts onto the flange causing the membrane to air-tight seal the mouth of the receptacle.

17. A method according to claim 16 including the additional step of placing the receptacle in a support member which comprises a stem connected at one end to a base and at the other end to a recess which receives the receptacle.

18. A method according to claim 17 comprising the further step of applying a detachable lid to the receptacle such that a channel on the lid engages the peripheral flange irrespective of whether the membrane is on or off the receptacle.
19. A method according to claim 18 wherein the biocompatible gas may be Carbon Dioxide.

20. A method according to claim 19 wherein the receptacle comprises layered plastics wherein the inner layer is virgin polypropylene and is biocompatible with a low oxygen transmissibility coefficient.

21. A method for producing a sealed plastics container for an alcoholic beverage such as wine comprising the steps of:
   a) taking a plastics receptacle formed from a plastics material,
   b) introducing an alcoholic beverage into the receptacle,
   c) displacing residual oxygen from the receptacle by introducing gaseous Carbon Dioxide, Nitrogen or a mixture of both in predetermined proportions or other suitable food grade gas into the receptacle,
   d) applying a membrane to the open mouth of the receptacle so that the membrane adheres by heat sealing to a peripheral flange formed around the open mouth of the receptacle to thereby provide an airtight seal.

22. A method for packaging an alcoholic beverage in a container as hereinbefore described comprising the steps of:
   a) taking a plastics receptacle suitable for holding an alcoholic beverage and having an open mouth with a peripheral flange thereabout and also having a biocompatible inner surface and a wall with a low gas transmissibility coefficient;
   b) introducing into the receptacle an alcoholic beverage such as wine modified for use in a plastics container, leaving a headspace between the surface of the beverage and the mouth,
   c) introducing the receptacle into a controlled environment pressurised to enable evacuation of air from the headspace of the receptacle and the surrounding space within the controlled environment;
   d) substituting displaced air with a biocompatible gas introduced under positive pressure within the controlled environment;
e) applying a sealing membrane to the peripheral flange of the receptacle to trap said biocompatible gas in the headspace formed therein and whilst the surrounding environment is under positive pressure;
f) removing the receptacle from the controlled environment.

23. A method according to claim 22, comprising the additional step before filling the receptacle of purging the receptacle of oxygen.

24. A method of packaging sealed containers for holding an alcoholic beverage as hereinbefore described comprising the steps of;
   a) taking a carton of a predetermined size;
   b) introducing into the container an air tight liner material which may substantially conform to the internal contour of said carton and forms a packaging envelope;
   c) placing in the envelope a predetermined number of the sealed packing containers;
   d) evacuating residual air from the envelope and substituting a biocompatible gas within the envelope;
   e) sealing the envelope to trap the biocompatible gas therein.

25. A method of packaging according to claim 18 wherein the introduction of the biocompatible gas takes place in a controlled environment wherein the biocompatible gas is introduced under positive pressure.

26. A method as hereinbefore described according to any one of the foregoing method claims wherein to enable the appropriate choice of inert gas the wine is first adjusted to ensure that selected constituents of the wine fall within pre-determined limits namely,

   free sulphur dioxide between 30-40 ppm,
   dissolved oxygen less than 1.5mg per litre,
   dissolved carbon dioxide 0.4 to 0.8 grams per litre.
## COMPARISON OF POLYMER MATERIALS

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*gm/100 in.²/24 hr./ml  \hspace{1cm} \hspace{1cm} \hspace{1cm} \hspace{1cm} P - Poor \hspace{1cm} \hspace{1cm} \hspace{1cm} \hspace{1cm} F - Fair \hspace{1cm} \hspace{1cm} \hspace{1cm} \hspace{1cm} E - Excellent

**cc/m²/24 hr./ml

(Note: MVTR value multiplied times 15.5 = MVTR in gms/m²/24 hrs./ml)

**FIG. 7**
### INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

Int Cl®: B65D 77/20, 81/20, 31/02; A47G 19/22

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: B65D 77/20, 81/20, 31/02; A47G 19/22

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

AU: IPC as above

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

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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* Special categories of cited documents:

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

**E** earlier document but published on or after the international filing date

**L** document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

**O** document referring to an oral disclosure, use, exhibition or other means

**P** document published prior to the international filing date but later than the priority date claimed

**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

**&** document member of the same patent family

Date of the actual completion of the international search

20 December 1995

Date of mailing of the international search report

29 December 1995

Name and mailing address of the ISA/AU

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Authorized officer

[Signature]

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END OF ANNEX