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(54) **PROCESS FOR PRODUCING BICOLOURED ALUMINIUM CONTAINERS**

VERFAHREN ZUR HERSTELLUNG VON ZWEIFARBIGEN ALUMINIUMBEHÄLTERN

PROCESSUS DE PRODUCTION DE RÉCIPIENTS EN ALUMINIUM BICOLORE

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## Description

**[0001]** The present invention relates to a process for producing aluminium containers and in particular to beverage aluminium capsules.

**[0002]** Containers made of aluminium foils are very current and have been known for a long time. These containers are very often used in the field of food industry for storing and dispensing food ingredients.

**[0003]** Such aluminium containers are particularly used in the field of production of beverages : they can present the form of a capsule containing beverage ingredients designed for insertion in a beverage production device in which a liquid enters the capsule in order to interact with ingredients in the capsule and to drain a beverage from the capsule. The capsules can contain different types of beverage ingredients in order to produce different types of beverages. Usually the exterior side of the capsules present different colours according to the nature of the beverage ingredients stored in the capsule.

**[0004]** These aluminium containers or capsules are commonly produced by implementing the following steps :

- cutting an aluminium foil to fit the dimensions of the container,
- deep drawing the precut aluminium foil to preform a body and simultaneously rolling the edges which usually present a torn and sharp aspect,
- filling the container body with the ingredients to be stored inside, and
- closing the stamped container by a cover.

**[0005]** To get containers or capsules of different outside colours, a face of the starting aluminium foil is coloured so that when it is deep drawn, the exterior face of the container appears with the colour.

**[0006]** In the nowadays systems implementing a beverage production machine associated with a range of specific capsules, an increase number of different capsules containing different beverage-type ingredients is implemented so as to propose to customers a large panel of different beverages and to continuously provide the customers with new beverages. It can lead to the production of aluminium containers with a high number of different colours to differentiate each new beverage from the others and it can be difficult for the customers to memorise the colour corresponding to each beverage.

**[0007]** For example EP 468079 and EP 1849715 describe the production of aluminium beverage capsules of which external faces are coloured.

**[0008]** A solution could be to provide beverage information on the cover closing the capsule body, yet such a solution would imply the production of specific covers for each existing beverage and consequently a more complicated and expansive production of the capsules. Besides, this solution would not enable a rapid and direct

knowledge of the beverage inside the capsule without manipulating, orienting the capsule and reading the information written on the cover. A problem is that, when a high number of beverage capsules exists, it should be possible for the customer to select the right beverage and capsule by a simple glance. The fact or writing information on the cover is not satisfying since the capsules are often stored with the cover oriented downside or randomly placed in a box.

**[0009]** Another solution could be to associate a second colour to the first one on the exterior face of the body of the capsule for example by deep drawing an aluminium foil painted on one of his face with two colours e.g. in the form of an alternation of lines of two different colours. Yet due to the deformation of the aluminium surface during the deep drawing, the resulting aspect of the capsule could not be perfectly controlled and may present an irregular aspect from one capsule to another. Besides, some trials showed that it was not easy for customers to rapidly differentiate containers of different colours combinations when containers had been randomly mixed.

**[0010]** It is neither a solution to imagine colouring the outside of the capsule once it has been deep drawn on account of production steps optimization and production costs, the number of produced beverage capsules being huge. Actually today some plants can produce up to millions capsules per day and it impossible to apply a coloured treatment on a part of the capsule.

**[0011]** The present invention aims at solving the problem of providing aluminium foil made containers, in particular beverage capsules, presenting an outside aspect enabling the differentiation of containers according to their contents, especially according to content variations, and that can be produced in a huge amount without complicating the known production process and increasing its cost.

**[0012]** Another problem is to solve the problem of increasing the number of different colours for aluminium foil made containers without complicating the known production process.

**[0013]** The invention concerns a process for producing an aluminium container for edible products or beverage ingredients, said process comprising the steps of:

- cutting an aluminium foil to produce a piece of aluminium fitting the dimensions of the container,
- deep drawing the piece of aluminium foil to form a container body and rolling the edges of the container body on the exterior side of the deep drawn container in order to form a curled edge, wherein each of one the two faces of the starting aluminium foil presents a colour treatment of different colour than the other face, the colour of the exterior side of the container body and the colour of the curled edge being different from the natural colour of the aluminium foil.

**[0014]** The process usually comprises a subsequent step of filling the container body and a step of closing the

container body by a lid.

**[0015]** Concerning the starting aluminium foil, colour treatments of the faces of said foil are usually realised by application of a paint composition comprising at least a pigment and a lacquer. This application is usually made by roller coatings on each side of the foil.

**[0016]** According to the invention, the paint compositions for each face of the starting aluminium foil differ by the nature of the pigment so that the faces finally present different colours. Usually, the paint composition that is applied on the face of the starting aluminium foil intended to form the interior face of the aluminium container comprises also a welding lacquer, usually a heat seal lacquer. This lacquer enables the welding of the lid on the edges of the opening of the container body, preferably on the flange-like rim of the container. Welding is usually realised by heating. Such welding lacquers are well known products usually implemented for the production of aluminium containers.

**[0017]** The aluminium container is produced as a container for storing an edible product. It is preferable that at least one of the colour treatments is realised with a food agreed paint composition. Effectively since the starting aluminium foil is treated on its both faces by a colour treatment, one of the faces is in contact with the edible product stored in the container and said face must be designed for a safe food contact. Then for this use the aluminium foil must be deep drawn so that the inside of the container body presents the colour treatment that is realised with food agreed lacquers and pigments.

**[0018]** In the process of the present invention the container is prepared starting from an aluminium foil which is first cut to provide a piece of aluminium fitting the dimensions of the final container to be obtained. This step results in the production of sharp and torn edges around the container body. This piece of aluminium foil is deep drawn according to known deep drawing process in either one or several deep drawing steps ; during the at least one deep drawing step, the edges of the aluminium foil piece are rolled to provide a nice and secure aspect to the edge of the container body. The rolling operation is realised by rolling the edges on themselves in direction of the exterior face of the container body. Then it is the same aluminium foil face that is inside the body container that becomes apparent at the exterior of the curled edge. According to the invention, the colour of the curled edge is different from the natural colour of the aluminium foil, and the colour of the exterior side of the container body is different from the natural colour of the aluminium foil too. "Natural colour of aluminium" means the colour of aluminium which is not altered by any colour treatment. Then view from the exterior the aluminium container of the present invention can present two parts of different colours, each being different from the natural colour of the aluminium foil : one part is the exterior face of the container body presenting one coloured face of the starting aluminium foil and the other part is the curled edge presenting the colour of the other face of the starting alu-

minium foil from which the container is made.

**[0019]** Finally the opening of the container can be closed by a lid or cover like a foil or a membrane. Usually the lid is attached to a flange-like rim between the container body and the curled edge, this flange can be produced during deep drawing step.

**[0020]** The aluminium container preferably contains an edible product. According to the preferred embodiment of the present invention, the aluminium container is a capsule containing at least one beverage ingredient designed for insertion in a beverage production device in which a liquid enters the capsule in order to interact with the ingredient in the capsule and to drain a beverage from the capsule.

**[0021]** The present invention presents the advantage of enabling the production of capsules with a high number of different colour combinations of the container body exterior face and the curled edge without complicating the known production process of aluminium containers. Then the fact of producing coloured capsules does not decrease the capsule production rate, which is the most important advantage of the present invention.

**[0022]** The way the capsules are coloured on the container body exterior face and the curled edge enables a rapid selection of the desired container by a simple glance even if a high number of different coloured containers are present. This property is helpful for the consumer in face of the final container filled with product and laying other its lid. It is also helpful for the container producer during the step of storage of unfilled containers since the containers can be piled up while the colours of the edge of the containers staying apparent. Moreover it has also be surprisingly noticed that the fact of having only a thin touch of colour on the curled edge of the capsule is sufficient for the customer to identify the capsule he is searching for, which was not prima facie obvious.

**[0023]** The way the containers are coloured is particularly adapted for the presentation of the containers by range or variety according to the products stored inside. In particular for the use of the containers as beverage capsules, it is possible to create different ranges based on different basic beverages like tea, coffee and chocolate by applying the same colour on the container body exterior face and to differentiate inside each range different beverage specialities by applying different colours on the curled edges, for example in the tea range to differentiate green, black, red, herbal tea, in the coffee range to differentiate several origins, etc ...

### **Brief description of the drawings**

**[0024]** The characteristics and advantages of the invention will be better understood in relation to the figures which follow :

- Figure 1 is a cross section view of an aluminium container,
- Figure 2 is a perspective view of an aluminium con-

- tainer,
- Figure 3 is a schematic diagram of the different steps of production of the container according to the present invention.

### **Detailed description of the drawings**

**[0025]** Figures 1 and 2 illustrate the type of aluminium containers to which the present invention refers. The aluminium container 1 is made of an aluminium foil that has been stamped in order to form a container body 7. The extremity of the container body presents a flange-like rim 4 and a curled edge 2. The opening of the container is closed by a lid 3 welded on the flange-like rim 4. The product stored in the container 1 has not been represented. According to the invention, the aluminium foil from which the container is made presents two faces 61, 62 presenting different colour treatments. Due to this difference of treatment, the container presents a curled edge 2 of different colour from the container body 7 and the flange-like rim 4, said colour being represented in a stipple fashion in Figures 1 and 2.

**[0026]** Figure 3 illustrates a process for producing the containers of the present invention. In steps a) and b), a piece of aluminium foil 6 is preformed by deep drawing means 8. The starting piece of aluminium foil 6 presents two faces 61, 62 with different colour treatments. For the use of the container in food applications, it is preferable that the face 62 is treated with food agreed pigment and lacquer. In step c), the walls of the container body 7 created by deep drawing are folded to create flange-like rims. In step d), the edges of the container are rolled. Yet the steps b), c) and d) can be simultaneously realised during the deep drawing step. In step e) the container is filled with the product 5 to be stored inside and said product is eventually tamped down. Finally in step f) the container is closed by welding a lid on the flange-like rim 4.

### **Claims**

1. Process for producing an aluminium container (1) for edible products or beverage ingredients comprising the steps of:
  - cutting an aluminium foil to produce a piece of aluminium (6) fitting the dimensions of the container,
  - deep drawing the piece of aluminium foil (6) to form a container body (7) and rolling the edges of the container body on the exterior side of the deep drawn container in order to form a curled edge (2),

wherein each one of the two faces of the starting aluminium foil presents a colour treatment of different colour than the other face, the colour of the exterior side of the container body and the colour of

the curled edge being different from the natural colour of the aluminium foil.

2. Process according to Claim 1 wherein at least one of the colour treatments is realised with a food agreed paint composition.
3. Process according to Claim 2 wherein the aluminium foil is deep drawn so that the inside of the container body (7) presents the colour treatment that is realised with a food agreed pigment and lacquer.
4. Process according to any of the precedent claims wherein it comprises a step of filling the container body (7) and a step of closing the container body by a lid (3).
5. Process according to the precedent claim wherein the container body (7) is filled with an edible product (7).
6. Process according to any of the precedent claims for producing a capsule containing at least a beverage ingredient designed for insertion in a beverage production device in which a liquid enters the capsule in order to interact with the ingredient in the capsule and to drain a beverage from the capsule.

### **Patentansprüche**

1. Verfahren zur Herstellung eines Aluminiumbehälters (1) für essbare Produkte oder Getränkzutaten mit den folgenden Schritten:
  - Schneiden einer Aluminiumfolie zur Herstellung eines Aluminiumstückes (6), das mit den Abmessungen des Behälters übereinstimmt,
  - Tiefziehen des Aluminiumfolienstückes (6) zur Bildung eines Behälterkörpers (7) und Einrollen der Ränder des Behälterkörpers auf der Außenseite des tiefgezogenen Behälters, um einen gebördelten Rand (2) auszubilden,

wobei die beiden Flächen der Ausgangsaluminiumfolie jeweils eine Farbbehandlung in voneinander unterschiedlichen Farben aufweist, wobei sich die Farbe der Außenseite des Behälterkörpers und die Farbe des gebördelten Randes von der natürlichen Farbe der Aluminiumfolie unterscheiden.
2. Verfahren gemäß Anspruch 1, wobei mindestens eine der Farbbehandlungen mit einer nahrungsmittelverträglichen Farbzusammensetzung durchgeführt wird.
3. Verfahren gemäß Anspruch 2, wobei die Aluminiumfolie derart tiefgezogen ist, dass die Innenseite des

Behälterkörpers (7) die Farbbehandlung aufweist, die mit einem nahrungsmittelverträglichen Pigment und Lack durchgeführt wird.

4. Verfahren gemäß einem der vorhergehenden Ansprüche, wobei dieses einen Schritt des Befüllens des Behälterkörpers (7) und einen Schritt des Verschließens des Behälterkörpers mit einem Deckel (3) umfasst. 5
5. Verfahren gemäß dem vorhergehenden Anspruch, wobei der Behälterkörper (7) mit einem essbaren Produkt (7) befüllt wird. 10
6. Verfahren gemäß einem der vorhergehenden Ansprüche zur Herstellung einer mindestens eine Getränkezutat enthaltenden Kapsel, die zum Einführen in eine Getränkeherstellungsvorrichtung ausgelegt ist, in welcher eine Flüssigkeit in die Kapsel eintritt, um mit der Zutat in der Kapsel zusammenzuwirken und ein Getränk aus der Kapsel abzuleiten. 15 20

#### Revendications

1. Procédé de production d'un récipient en aluminium (1) pour produits comestibles ou ingrédients de boisson, comprenant les étapes suivantes : 25
  - découpage d'une feuille d'aluminium pour produire une pièce en aluminium (6) correspondant aux dimensions du récipient, 30
  - emboutissage profond de la pièce de feuille d'aluminium (6) pour former un corps de récipient (7) et enroulement des bords du corps de récipient sur le côté extérieur du récipient formé par emboutissage profond pour former un bord enroulé (2), 35

dans lequel chacune des deux faces de la feuille d'aluminium de départ présente un traitement de couleur de couleur différente de l'autre face, la couleur du côté extérieur du corps de récipient et la couleur du bord enroulé étant différentes de la couleur naturelle de la feuille d'aluminium. 40 45
2. Procédé selon la revendication 1, dans lequel au moins un des traitements de couleur est réalisé avec une composition de peinture de qualité alimentaire. 50
3. Procédé selon la revendication 2, dans lequel la feuille d'aluminium est soumis à un emboutissage profond de sorte que l'intérieur du corps de récipient (7) présente le traitement de couleur qui est réalisé avec un pigment de qualité alimentaire et de la laque. 55
4. Procédé selon l'une quelconque des revendications précédentes, comprenant une étape de remplissage

du corps de récipient (7) et une étape de fermeture du corps de récipient par un opercule (3).

5. Procédé selon la revendication précédente, dans lequel le corps de récipient (7) est rempli avec un produit comestible (7).
6. Procédé selon l'une quelconque des revendications précédentes pour la production d'une capsule contenant au moins un ingrédient de boisson conçue pour une insertion dans un dispositif de production de boisson dans lequel un liquide pénètre dans la capsule de manière à interagir avec l'ingrédient dans la capsule et à évacuer une boisson de la capsule.

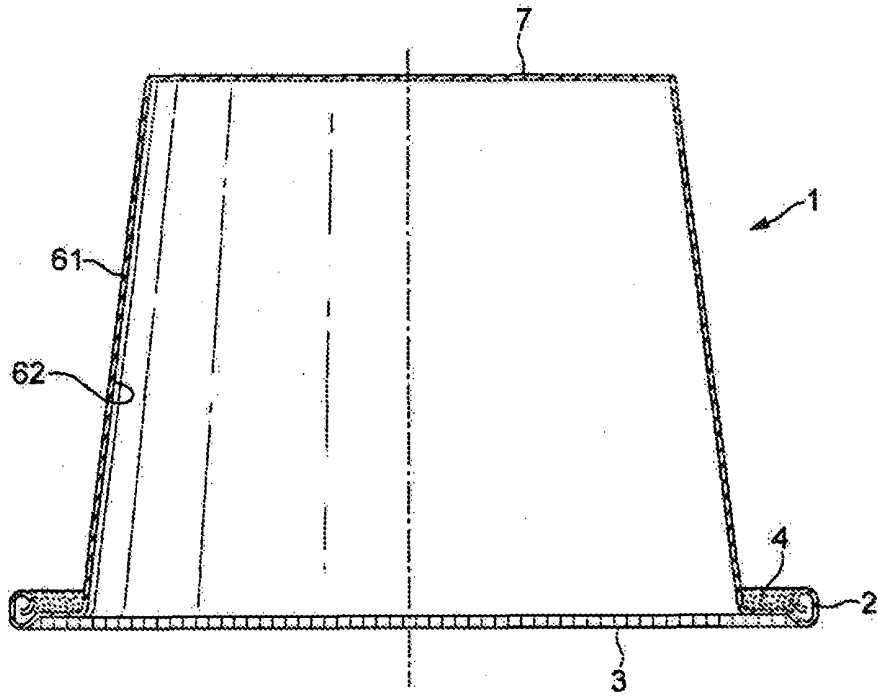


FIG. 1

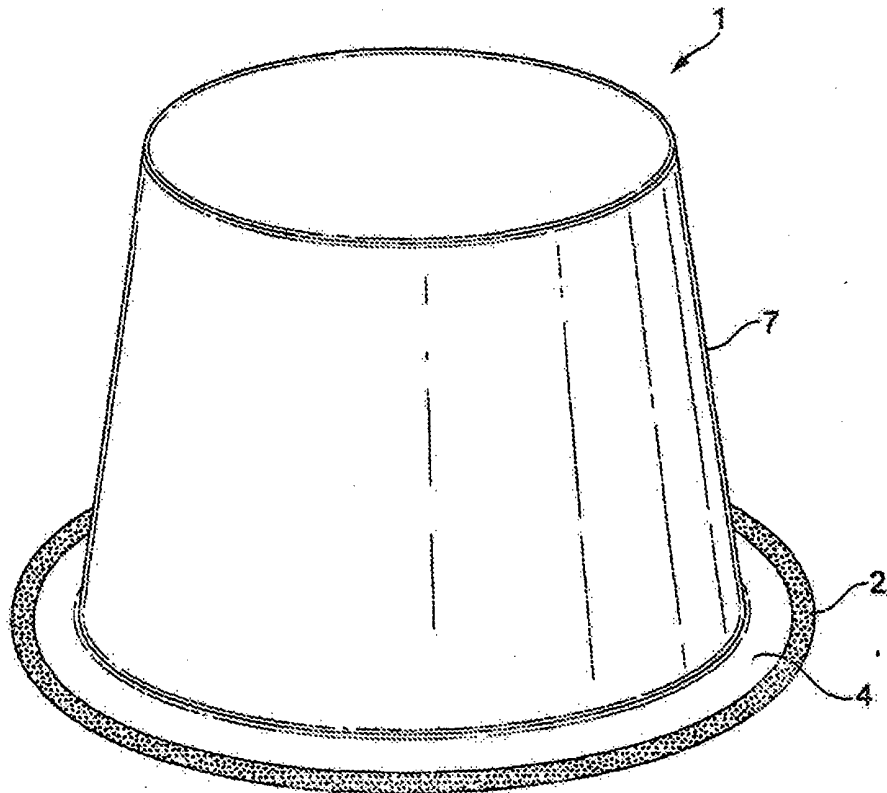


FIG. 2

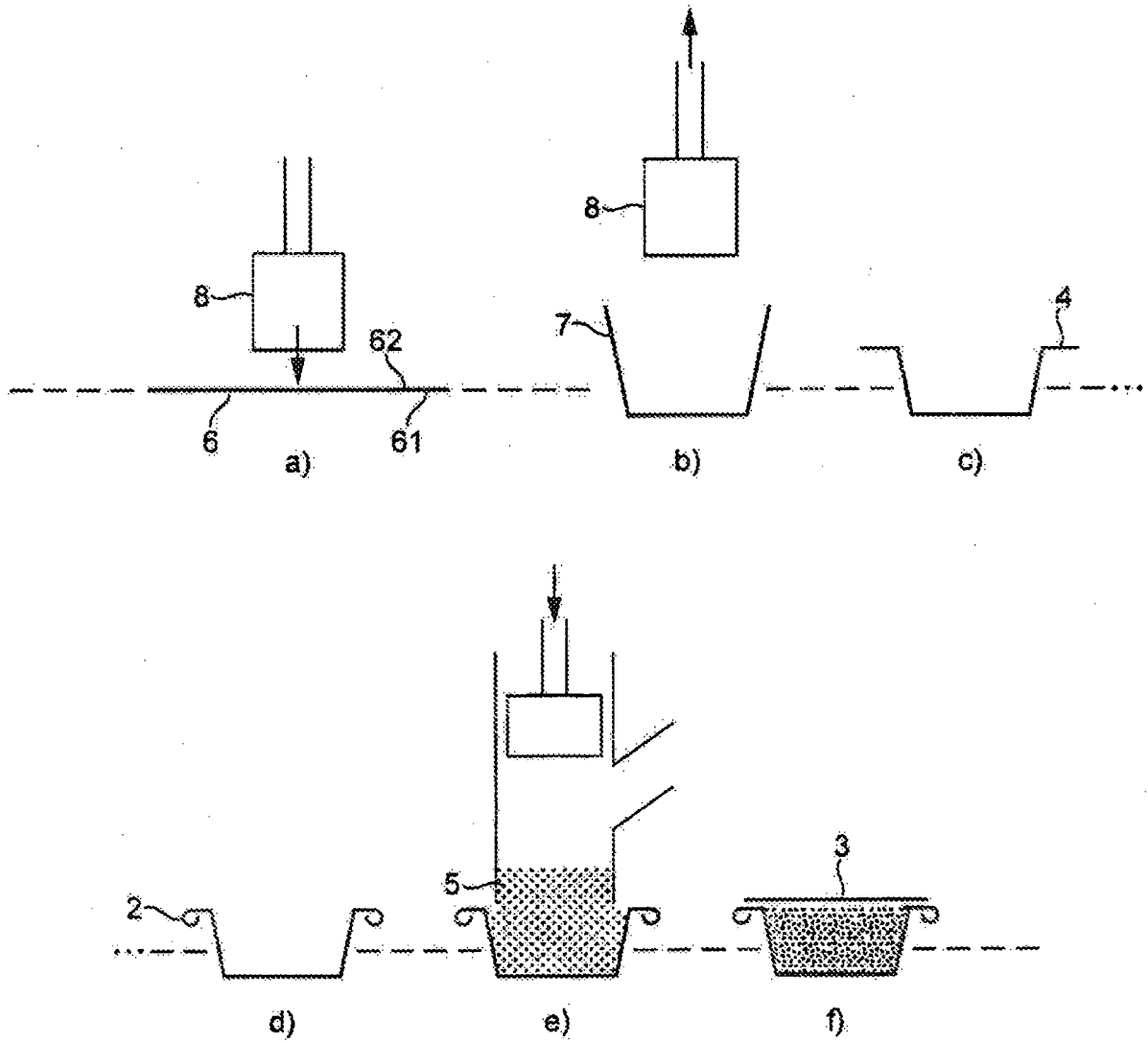


FIG. 3

**REFERENCES CITED IN THE DESCRIPTION**

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