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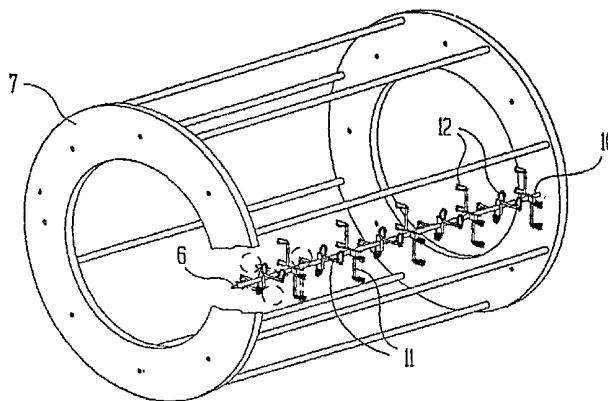
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[Continued on next page]

(54) Title: MANUFACTURING PROCESS OF CHRISTMAS TREE DECORATIONS AND RACKS FOR THEIR FIXING DURING THIS PROCESS



(57) Abstract: A manufacturing process of Christmas tree decorations where glass half-products (1) are first blown to required dimensions and shapes, incl. the process stem. This glass half-product (1) is fixed into the rack and placed into the metal-coating device where, under vacuum conditions, a thin (1 to 7 microns) layer of metals and/or their alloys is coated on its surface by vacuum plating or vacuum powder coating processes. The metal-coated surfaces created this way may be finished in various colours using clear and colour varnishes either glossy or matt. The glass half-products (1) for Christmas tree decorations may be provided with shading in the place of intended décor before the half-product is put into the vacuum metal-coating device. After the shading elements are removed, clear non-coated spots are created on the decoration surfaces. The rack accommodating the glass half-products of decorations is for their placement into the metal-coating device when above methods are performed consisting of a plastic or metal channel (2), into which at least one flexible shading fixture (3) with at least one cavity (4) is placed. The flexible shading fixture (3) is fixed in the metal channel (2) by strutting between its side tags. The channel (2) is provided with two side pivots (6) for the accommodation into the journal bearings positioned on the opposite sides along the perimeter of the working rotating drum (7) of the vacuum metal-coating device.

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Manufacturing process of Christmas tree decorations and racks for their fixing during this process

5

#### Technical field of the invention

The invention involves a manufacturing process of Christmas tree decorations, especially those with ornaments and racks for fixing the decorations during their processing by vacuum technology.

10

#### Background of the invention

15

At present, Christmas tree decorations are manufactured in the way where glass half-products are blown, either manually or by a machine, to required dimensions and shapes, incl. the process stem. Half-products are then left clear or they can be further coloured and ornamented (fitted with a décor) or they can be silver-plated with consequent colouring and ornamenting operations.

20

The principle of silver-plating operation is to coat glass half-product internal surfaces with a thin silver layer. For these purposes reduction of silver nitrate complex solution by sodium tartrate, or by other reducing agents, are used. This method has its drawback in using ammonia for transfer of silver nitrate into the complex solution. Apart from the thin layer of silver coating (2 to 4 microns) on the inner surface of the Christmas tree decoration half-product, hazardous chemical compounds that must be disposed of in an environmentally friendly way, also result in this reaction. Moreover, silver nitrate also belongs among hazardous chemicals and its handling is therefore difficult. Operators must wear breathing protection, rubber aprons, rubber boots and gloves to be protected against breathing ammonia vapours or skin contact with silver-plating solutions. Operators also must attend an annual medical inspection.

30

Summary of the invention

The above-mentioned problems are eliminated in the manufacturing process of Christmas tree decorations where glass half-products are blown to required dimensions and shapes, incl. the process stem. The new process principle is based on the idea that the glass half-product is fixed into the rack first and then placed into the metal-coating device where, under vacuum conditions, a thin (1 to 7 microns) layer of metals and/or their alloys is coated on its surface by vacuum plating or vacuum powder coating processes. Metal-coated surfaces created this way may be finished in various colours using clear and colour varnishes either glossy or matt. For vacuum plating or vacuum powder coating processes some of the following metals, or their alloys, can be used: aluminium, copper, iron, nickel, silver, gold, magnesium, tin, chromium, vanadium and zinc.

Before placed into the metal-coating device, the glass half-products for Christmas tree decorations can be suitably shaded in the places of intended future ornaments leaving thus, after the coating process and shade removal, transparent uncoated places.

This shading can be achieved by various methods. In one of them the glass half-products for Christmas tree decorations are laid into a cavity of a shading fixture. The cavity exactly follows the glass half-product shape and size in a selected parting plane that can be changed according to selected ornament patterns. A part of the glass half-product is inserted into the cavity and thus protected against metal-coating and only the part projecting out of it is then metal-coated. The parting plane and its shape are made of flexible material providing good adhesion to the glass half-product and secure placement inside Christmas tree decoration is removed from the rack.

Another possibility how to shade desired placed consists of placing at least one removable cover on the glass half-product for Christmas tree decoration. The cover matches the required décor size and shape and closely fits to this surface.

Before the coloration process, the cover is removed. The cover may be suitably provided with a sticking surface for a better adhesion to the half-product.

5 Still another shading method is based on coating the desired places on the surface of glass half-product for Christmas tree decoration with a thin layer of removable substances, like varnishes, that can be easily removed after metal-coating is finished. Coloration processes by clear or coloured paints or matt paints may be performed either before or after the removable layer of varnish is taken away.

10

The above shown shading methods can be arbitrarily combined in a single product.

15 Depending on half product types, various racks are used for fixing of glass half-products for Christmas tree decorations in the metal-coating device. One of possible designs is that the rack consists of a plastic or metal channel containing at least one flexible cover with at least one cavity. This flexible cover is then fixed inside the channel by strutting between the channel side tags. At opposite ends of its lengthwise centre line, the channel is provided with two side pivots to be  
20 mounted into journal bearings positioned at opposite sides on the perimeter of working rotating drum of the metal-coating device.

25 Another possibility of rack design a rack consisting of a bearing metal/plastic rod provided with pivots at its ends to be accommodated in journal bearings located at opposite positions on the perimeter of working rotating drum of the metal-coating device. Crosswise the bearing rod centre-line, sliding/swinging metal/plastic arms are mounted on the rod. The arms are equipped with, at least, one clamp for accommodating and fixing the glass half-product stem. In order to adjust optimum spacing of separate glass half-products for Christmas tree  
30 decorations, the arms are provided with locking elements.

One of possible options of the above rack design is represented by an arrangement where the arms are fixed to the bearing rod by one of their ends

while the arms are assembled in couples mutually reversed by  $90^{\circ}$ . Arms in one couple are positioned one against the other so that one of them is fixed over the bearing rod and the other under it. Clamps for fixing the glass half-product stem are positioned across the longitudinal axis of their relevant arms consisting of two  
5 'V'-shaped jaws that are fitted on their inner sides with saw-tooth notches or roughened surface to accommodate and fix the stem. Active clamp parts of the same arm couples are mutually reversed by  $180^{\circ}$ .

Another of possible options of the above rack design is represented by an  
10 arrangement where the arms are fixed to the bearing rod by their centres bearing at each their end couples of opposed clamps consisting of two 'V'-shaped jaws that are fitted on their inner sides with saw-tooth notches or roughened surface to accommodate and fix the stem. Active clamp parts of the same arm couples are mutually reversed by  $180^{\circ}$  and clamp couples positioned at the opposite arm ends  
15 and clamp couples at the same ends of neighbouring parallel arms are also reversed by  $180^{\circ}$  by its active parts.

If glass half-products for Christmas tree spires are to be accommodated, the rack is designed so that the arms are created by a pre-stressed metal belt  
20 fixed at its centre to the bearing rod. The arms are arranged into opposed clamp couples so that each couple arms are closely fitted one to another and the arms are mutually reversed by  $90^{\circ}$ . At one arm end, fixings in a form of a conical plug are prepared to accommodate the end of the Christmas tree spire stems. At the opposite clamp couples of the same side, there are fixings shaped as cavities to  
25 accommodate the tips of the Christmas tree spires. Counterwise arm couples are mutually reversed by  $90^{\circ}$  so that the conical plugs of one couple are coaxial to the opposite couple cavities.

The above manufacturing process of Christmas tree decorations offers a  
30 great advantage in the elimination of conventional silver-plating in silver nitrate solutions and reducing agents, i.e. including ammonia, which means that this is a very suitable, environmentally & health friendly manufacturing process. Another advantage is that the above process enables to produce completely new products

where on surfaces of Christmas tree decorations transparent places are created that may be left either clear or further colour modified or decorated by ornaments.

5            Brief description of the drawings

The subject of said design, in particular the racks for stacking of glass products into the drum of vacuum metal-coating device, will be described below by the use of herewith enclosed drawings. Fig. 1 and 2 show examples of shading options using the removable covers. Fig. 3 shows a block diagram an example of flexible cover material, while Fig. 4 shows its placement into the drum of vacuum metal-coating device. Figs. 5, 7 and 9 show examples of some more rack types for fixing of glass half-products for Christmas tree decorations and Figs. 6, 8 and 10 showing their accommodation in the drum of vacuum metal-coating device.

15

Examples of the embodiment of the invention

In the manufacturing process of Christmas tree decorations according to the submitted invention, the glass half-product 1 of required size and shape is blown first in a traditional way; the half-product is fitted with the handling stem at its end. This way obtained glass half-product 1 is then fixed into a rack suitable to the half-product type as described below. The rack accommodating the glass half-products 1 is then placed into the metal-coating device. In this device, using the process of vacuum metal-coating or powder-coating, thin layers of metals and/or their alloys (1 to 7 microns thick) are formed on the treated surfaces. The layer thickness is specified according to the necessity to provide its non-transparency. The following metals, or their alloys, can be used in this operation: aluminium, copper, iron, nickel, silver, gold, magnesium, tin, chromium, vanadium and zinc. After the coating is complete, the glass half-products 1 are colour-treated by coating with clear or colour glossy varnishes or colour matt ones or by removal of a layer of removable material with consequent colour-treating.

30

In order to obtain Christmas tree decorations with ornaments (décor) the above method is modified so that the glass half-products 1 are fitted with shading covers (shades) in the places of intended décors before they are placed in the vacuum coating device. After the shades are removed, transparent placed are left  
5 on the surfaces of Christmas tree decorations corresponding by their respective shapes to the shade types used.

The simplest way is to use at least one removable shading cover 8 or 9 as shown in Figs. 1 and 2. The shading covers 8 and 9 are in the shape of the décor  
10 required and they can be provided with an adhesive agent on their contact faces with the half-products. Before subsequent colouring operations the shading covers 8 or 9 are removed.

Another possibility how to perform the shading is shown in Figs. 3 and 4. In  
15 this case, the glass half-products for Christmas tree decorations 1 are placed in the cavity 4 of the shading fixture 3. The cavity 4 exactly matches the size and shape of the glass-half product 1 at the selected parting plane 5, which determines what part of the glass-half product 1 is covered and the shape of which corresponds to the required décor (ornament). A part of the glass-half product 1 is  
20 thus inserted inside the cavity 4 and protected against coating with metals as only the part projecting out of the cavity 4 of the shading fixture 3. In practical use the shading fixture has more than one cavity 4 and it is made of flexible materials like plastics or rubber, which facilitates the adhesion to the glass half-product and its fixing in the shading fixture 3. The shading fixture 3 is then placed into a plastic or  
25 metal channel 2, into which several shading fixtures 3 may be placed at the same time and they are fixed in the metal channel 2 by strutting between its side tags. In its lengthwise centre line at its opposite ends, the channel 2 is provided with two side pivots 6 for the accommodation into the journal bearings positioned on the opposite sides along the perimeter of the working rotating drum 7 of the vacuum  
30 metal-coating device as shown in Fig. 4. Colouring operations are performed on Christmas tree decorations after they are removed from the rack.

Shading can be also made in the way that surfaces of the glass half-products 1 for Christmas tree decorations are in the places of future décor placement are coated with a layer of removable material - like varnish – that can be taken away after metal-coating operations. Coloration processes by clear or  
5 coloured paints or matt paints may be performed either before or after the removable layer of varnish is taken away.

The above mentioned shading methods can be arbitrarily combined at one  
10 single product.

Apart from the already mentioned rack for fixing of the glass half-products 1 shaped into the channel 2 and flexible shading fixtures 3, other racks/fixtures may be used as well. These possibilities are shown in Figs. 5, 7 and 9. In all cases the racks are formed with a holder consisting of bearing rod 10 (made of metal or  
15 plastic materials) provided at its ends with pivots 6 for fitting to journal bearings positioned in opposite places along the perimeter of the rotating drum 7 of vacuum metal-coating device. On this bearing rod 10 metal or plastic arms 11 are perpendicularly attached in a mounting type enabling their rotation and sliding along the rod axis. The arms 11 are provided with at least one clamp 12 or 121  
20 or/and 122 for accommodation and fixing of the stem of the glass half-products 1 for Christmas tree decorations. These arms 11 are equipped with arresting/locking elements to keep optimal spacing of accommodation of separate glass half-products 1 for Christmas tree decorations.

25 One option of the above mentioned design is in Fig.5. The arms 11 are here fixed to the bearing bar 10 by its one end forming thus couples of arms mutually reversed by  $90^{\circ}$ . The arms 11 belonging to one couple are opposite positioned so that one arm is fixed over the bearing rod 10 while the other underneath. The clamps 12 for fixing of the glass half-product 1 stem are positioned perpendicularly  
30 to the lengthwise centre line of their arms 11 and they are formed with 'V'-shaped jaws that are fitted on their inner sides with saw-tooth notches 13 to accommodate and fix the stem. Instead of the saw-tooth notches 13 their inner surfaces may be formed to make cavities or roughened. Active clamp 12 parts at the same arm 11

couples are mutually reversed by  $180^{\circ}$ . These fixing designs in the drum 7 of vacuum metal-coating device are shown in Fig. 6.

Another option of this design (see Fig. 7) is formed by the idea where arms 11 are fixed to the metal bearing rod 10 in their centres. At each of their ends a couple of opposite clamps 12 is fixed. The clamps again are formed with 'V'-shaped jaws that are fitted on their inner sides with saw-tooth notches 13 to accommodate and fix the stem of the glass half-product 1. Active clamp 12 parts in one couple are mutually reversed by  $180^{\circ}$ . Clamp couples 12 placed at the opposite arm ends 11 and clamp couples placed always at the neighbouring parallel arm 11 ends are also reversed by their active parts by  $180^{\circ}$ . This rack type is accommodated in the drum 7 of vacuum metal-coating device as shown in Fig. 8.

If glass half-products 1 for Christmas tree spires are involved, they can be accommodated as shown in Fig. 9 and placed into the drum 7 of metal-coating device as shown in Fig. 10. In this case, the rack is designed so that the arms 11 are created by a pre-stressed metal belt fixed at its centre to the bearing rod 10. The arms 11 are arranged into opposed clamp couples so that each couple arms are closely fitted one to another and the arms are mutually reversed by  $90^{\circ}$ . At one arm 11 end, fixing in a form of a conical plug 121 are prepared to accommodate the end of the Christmas tree spire stems. At the opposite arm 11 couples of the same side, there are fixings 122 shaped as cavities to accommodate the tips of the glass half-product 1 of Christmas tree spires. Counterwise arm 11 couples are mutually reversed by  $90^{\circ}$  so that the conical plugs 121 of one couple are coaxial to the opposite couple cavities 122 of the opposite arm 11 couple.

#### Industrial applicability

The above mentioned manufacturing process of Christmas tree decorations is suitable for production of any decorations where, in the final result, it is required to create vacant spots on the decoration half-product, either left clear and without any décor or further treated in colouring processes or fitting them with a décor or

combination of both. Wholly metal-coated decorations can be prepared by this method as a replacement of silver using processes. This manufacturing process is environmentally friendly as it eliminates adverse health impacts to operators.

## C L A I M S

1. The manufacturing process of Christmas tree decorations where glass half-products (1) are blown to required dimensions and shapes, including the process stem, c h a r a c t e r i s e d i n t h a t the glass half-product (1) is fixed into the rack first and then placed into the metal-coating device where, under vacuum conditions, a thin (1 to 7 microns) layer of metals and/or their alloys is coated on its surface by vacuum plating or vacuum powder coating processes and metal-coated surfaces created this way may be finished in various colours using clear and colour varnishes either glossy or matt.
2. The method according to Claim 1 c h a r a c t e r i s e d i n t h a t for vacuum plating or vacuum powder coating processes some of the following metals, or their alloys, can be used: aluminium, copper, iron, nickel, silver, gold, magnesium, tin, chromium, vanadium and zinc.
3. The method according to Claims 1 and 2 c h a r a c t e r i s e d i n t h a t the glass half-products (1) for Christmas tree decorations can be, before their placement in the metal-coating device, suitably shaded in the places of intended future ornaments leaving thus, after the coating process and shade removal, transparent uncoated places.
4. The method according to Claim 3 c h a r a c t e r i s e d i n t h a t the glass half-products (1) for Christmas tree decorations are laid into a cavity (4) of a shading fixture (3) and where this cavity (4) exactly matches the size and shape of the glass half-products (1) in a selected parting plane (5) where a part of the glass half-product (1) is inserted into the cavity (4) by which is protected against the metal-coating process and only the part of the half-product (1) projecting out of the cavity (4) is then metal-coated and where the parting plane (5) and its shape corresponds to the required décor and where the shading fixture (3) with the cavity(ies) (4) is made of flexible material providing good adhesion to the glass half-product (1) in the partition plane (5) and fixing the glass half-product (1) in this shading fixture (3) and where colouring operations

are performed after the metal-coated Christmas tree decoration is removed from the shading fixture (3).

- 5 5. The method according to Claims 3 or 4 characterised in that the shading is made so that the surface of glass half-products (1) for Christmas tree decorations is provided with at least one removable cover (8, 9) matching the required décor size and shape and closely fitting to this surface where this cover (8, 9) is removed before the metal-coated Christmas tree decorations are treated in colouring processes.
- 10 6. The method according to Claim 5 characterised in that the cover (8, 9) is provided on its one side with an adhesive coat that adheres to the glass half-product (1) of the Christmas tree decoration.
- 15 7. The method according to any of Claims from 3 to 6 characterised in that the shading of the glass half-product surface (1) of the Christmas tree decoration is created with a thin layer of removable substances, like varnishes, that can be easily removed after metal-coating is finished.
- 20 8. The method according to Claim 7 characterised in that coloration processes by clear or coloured paints or matt paints is performed after the removable layer of varnish is taken away.
- 25 9. The method according to Claim 7 characterised in that coloration processes by clear or coloured paints or matt paints is performed before the removable layer of varnish is taken away.
- 30 10. The rack accommodating the glass half-products of decorations is for their placement into the metal-coating device when methods under Claims 1 to 4 are performed, characterised in that it consists of a plastic or metal channel (2), into which at least one flexible shading fixture (3) with at least one cavity (4) is placed and where this flexible shading fixture (3) is fixed in the metal channel (2) by strutting between its side tags and where the channel (2)

is provided with two side pivots (6) for the accommodation into the journal bearings positioned on the opposite sides along the perimeter of the working rotating drum (7) of the vacuum metal-coating device.

5 11. The rack accommodating the glass half-products of decorations is for their placement into the metal-coating device when methods under Claims 1, 2 and any under Claims 3, 5, 6, 7, 8, 9 are performed, c h a r a c t e r i s e d  
10 i n t h a t it is formed with a holder consisting of bearing rod (10) (made of metal or plastic materials) provided at its ends with pivots (6) for fitting to journal bearings positioned in opposite places along the perimeter of the rotating drum (7) of vacuum metal-coating device and where metal or plastic arms (11), provided at least one clamp (12) for accommodation and fixing of half-product (1) stem are perpendicularly attached in a mounting type enabling their rotation and sliding along the rod axis and where these arms (11) are  
15 equipped with arresting/locking elements to keep optimal spacing of accommodation of separate glass half-products (11) for Christmas tree decorations..

20 12. The rack according to Claim 11 c h a r a c t e r i s e d i n t h a t the arms (11) fixed to the bearing bar (10) by their one end forming thus couples of arms mutually reversed by  $90^{\circ}$  where the arms (11) belonging to one couple are opposite positioned so that one arm is fixed over the bearing rod (10) while the other one under the bearing rod (10) and clamps (12) for fixing of the glass half-product (1) stem are positioned perpendicularly to the lengthwise centre  
25 line of their arms (11) and they are formed with 'V'-shaped jaws that are fitted on their inner sides with saw-tooth notches (13) or cavities or roughened surface for accommodation and fixing of the stem and where active clamp (12) parts of the same arm (11) couples are mutually reversed by  $180^{\circ}$ .

30 13. The rack according to Claim 11 c h a r a c t e r i s e d i n t h a t the arms (11) are fixed to the metal bearing rod (10) in their centres and where each of their ends a couple of opposite clamps (12) is fixed and where the clamps again are formed with 'V'-shaped jaws that are fitted on their inner sides, with

saw-tooth notches (13) or cavities or roughened surface for accommodation and fixing of the stem and where active clamp (12) parts of the same arm (11) couples are mutually reversed by  $180^{\circ}$ , while the couple of clamps (12) placed at the opposite arm (11) end and couple of clamps (12) placed always at the neighbouring parallel arm (11) ends are also reversed by their active parts by  $180^{\circ}$ .

14. The rack according to Claim 11 characterised in that the for accommodation of the glass half-products (1) for Christmas tree spires is formed a pre-stressed metal belt fixed at its centre to the bearing rod (10) and where the arms (11) are arranged into opposed clamp couples so that each couple arms (11) are closely fitted one to another and the arms are mutually reversed by  $90^{\circ}$  where at one arm (11) fixing in a form of a conical plug (121) is created to accommodate the end of the Christmas tree spire stem and where, at the opposite arm (11) couples of the same side, there are fixings (122) shaped as cavities to accommodate the tips of the glass half-product (1) of the Christmas tree spire and where the opposite arm (11) couple is reversed by  $90^{\circ}$  so that the conical plugs (121) of one couple are coaxial to the opposite couple cavities (122) of the opposite arm (11) couple.

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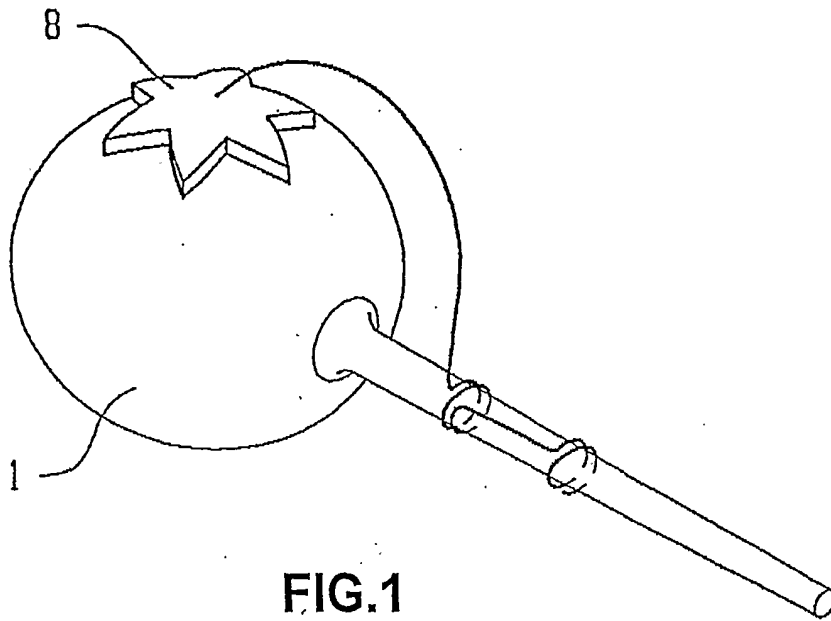


FIG. 1

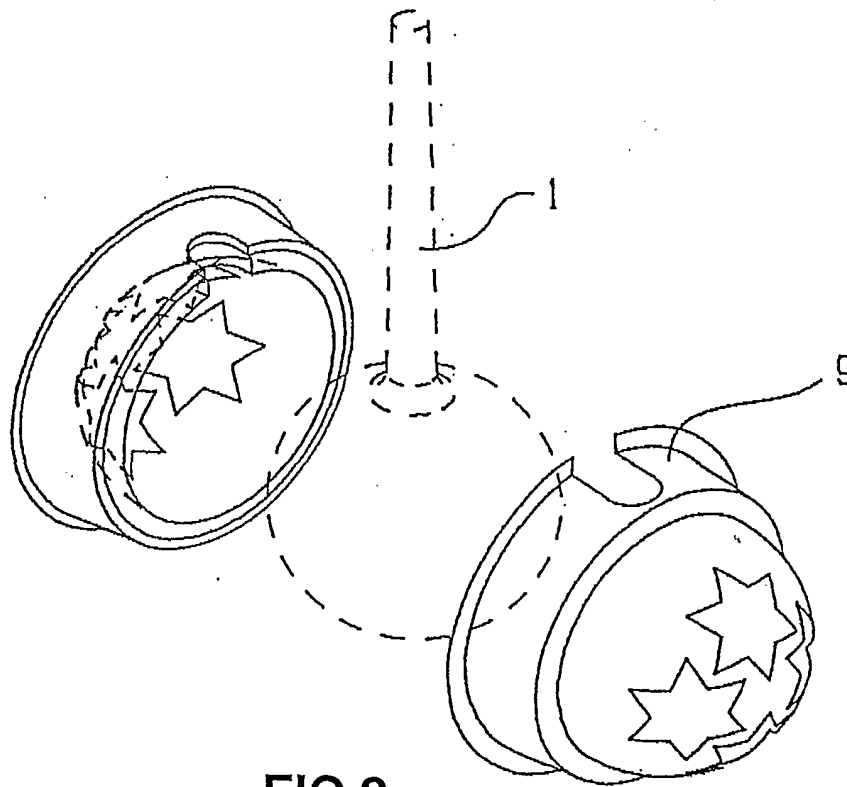
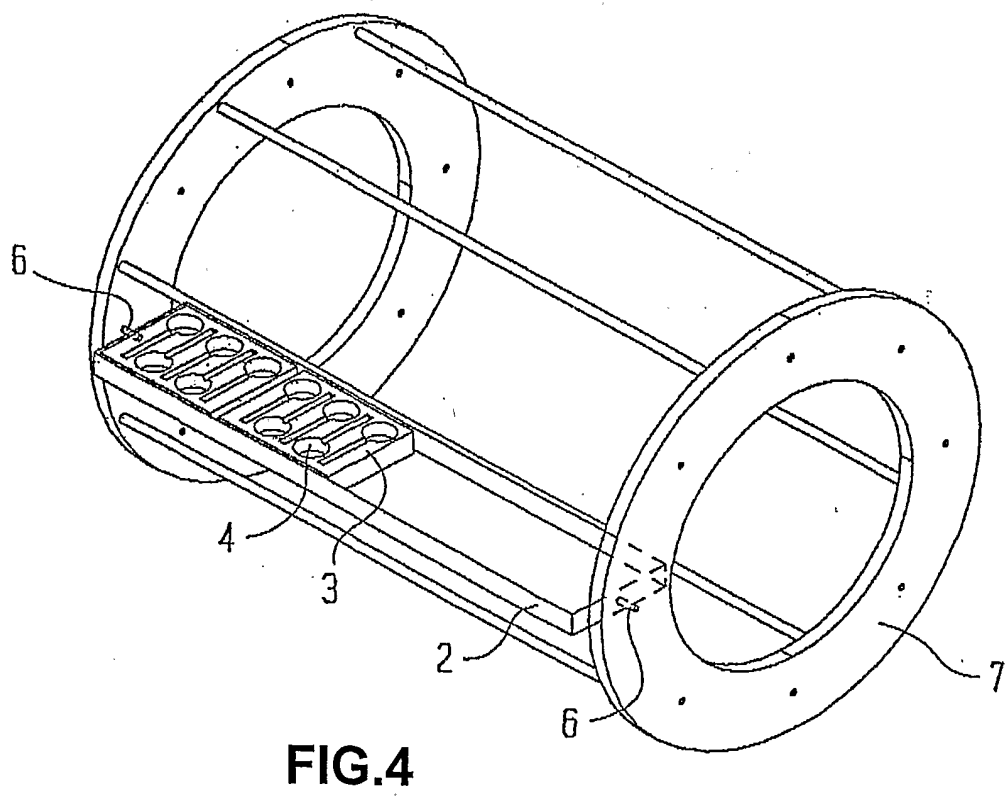
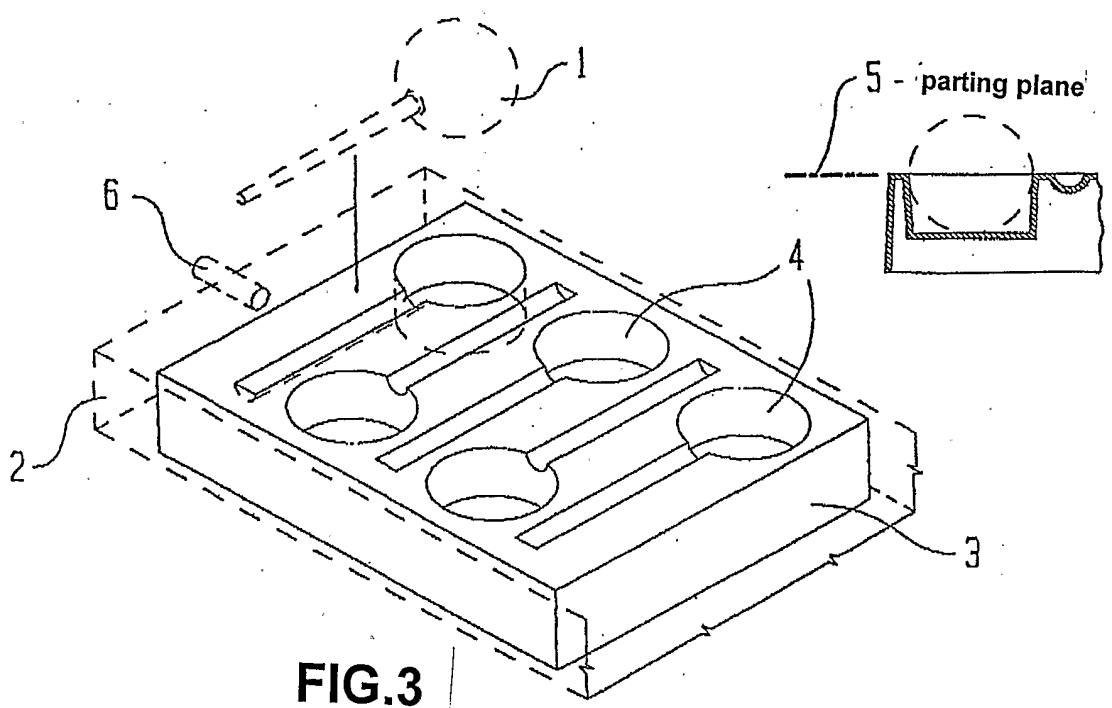


FIG. 2



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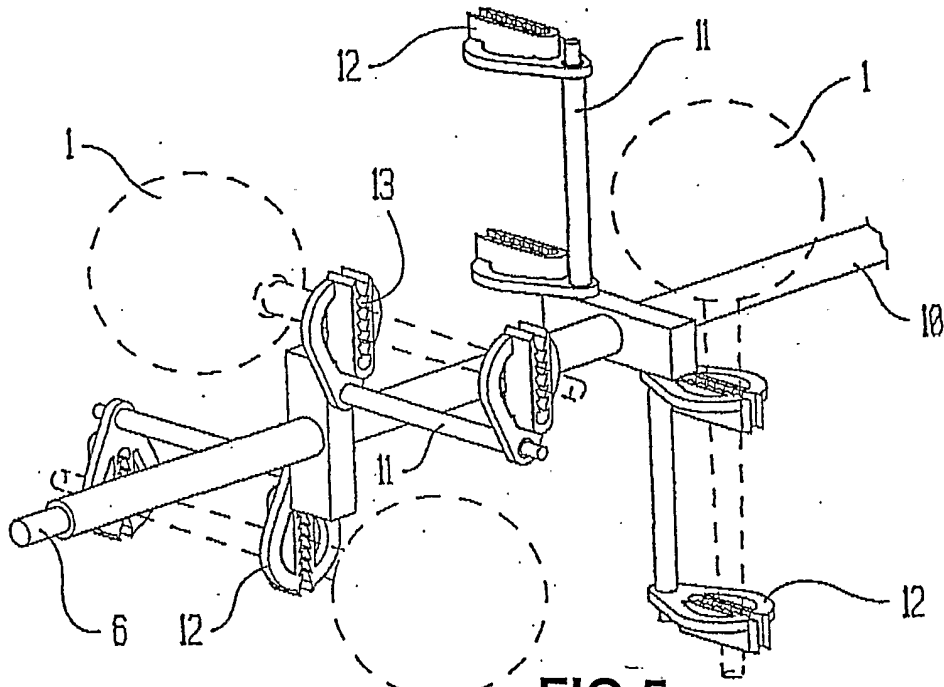


FIG.5

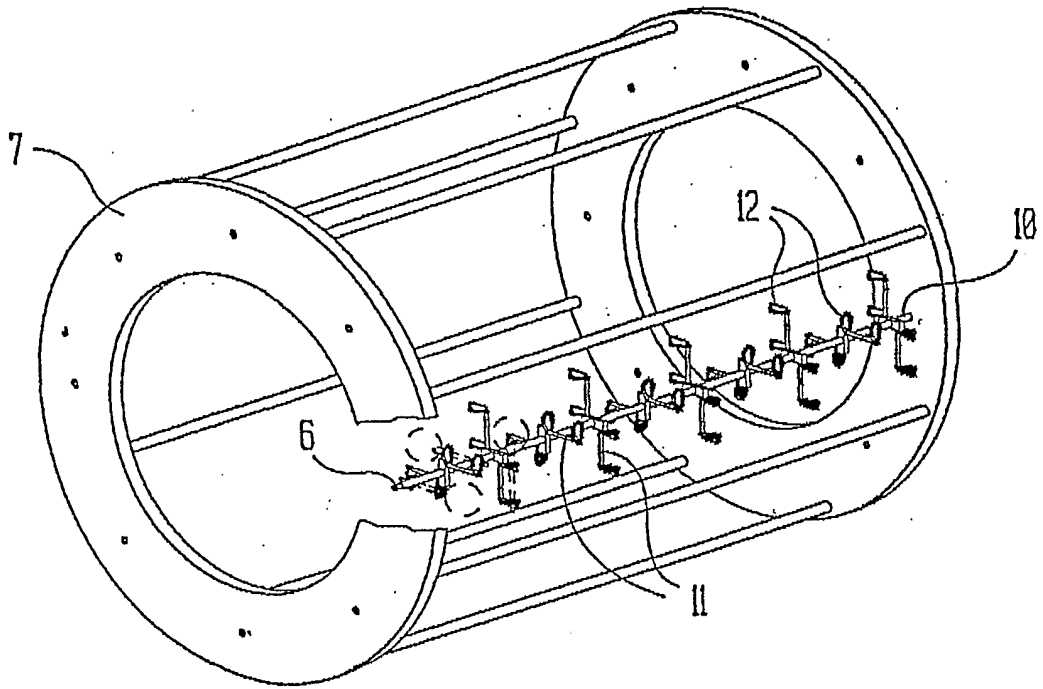


FIG.6

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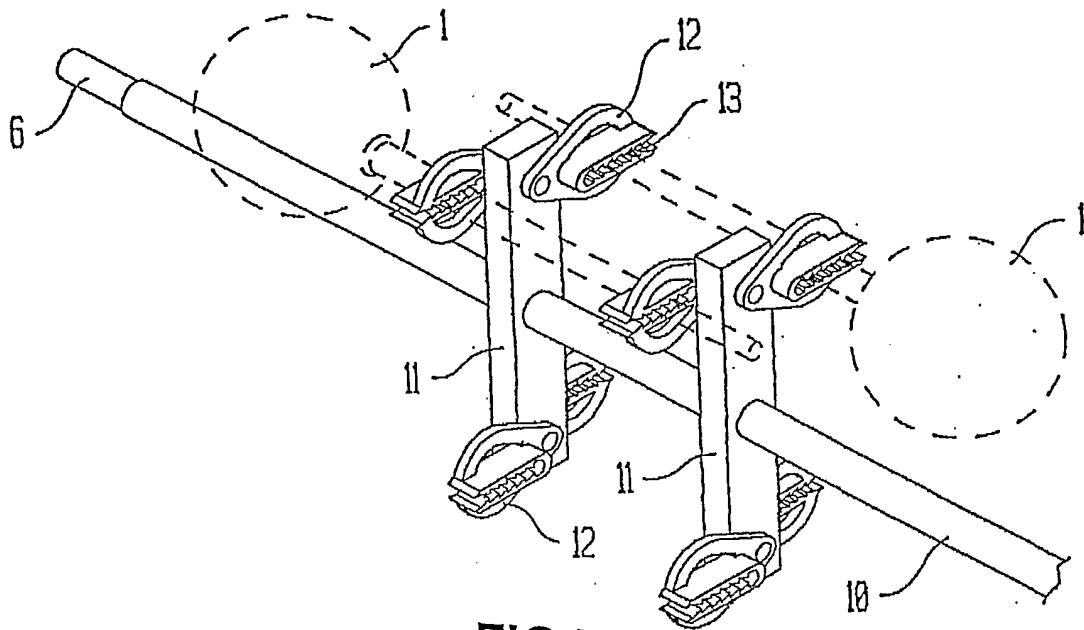


FIG. 7

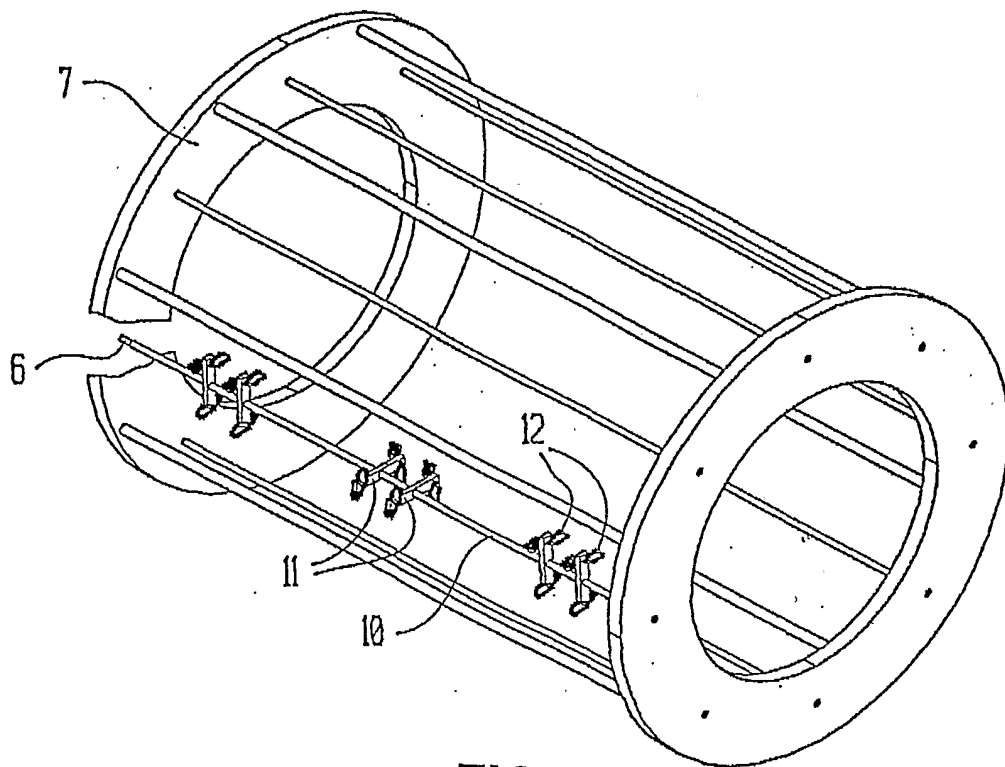


FIG. 8

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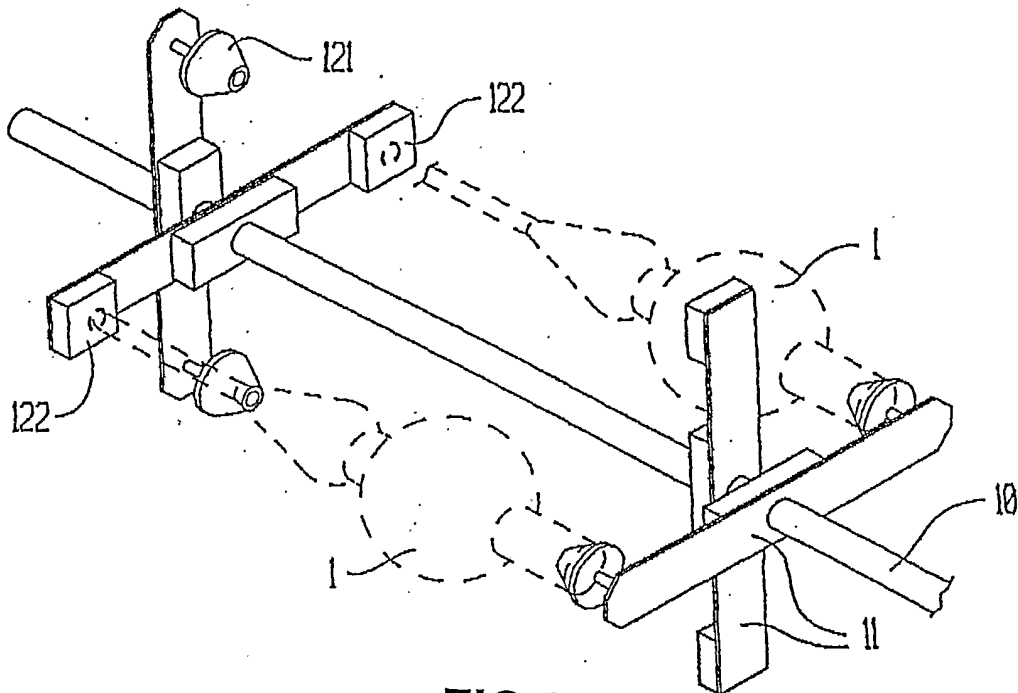


FIG.9

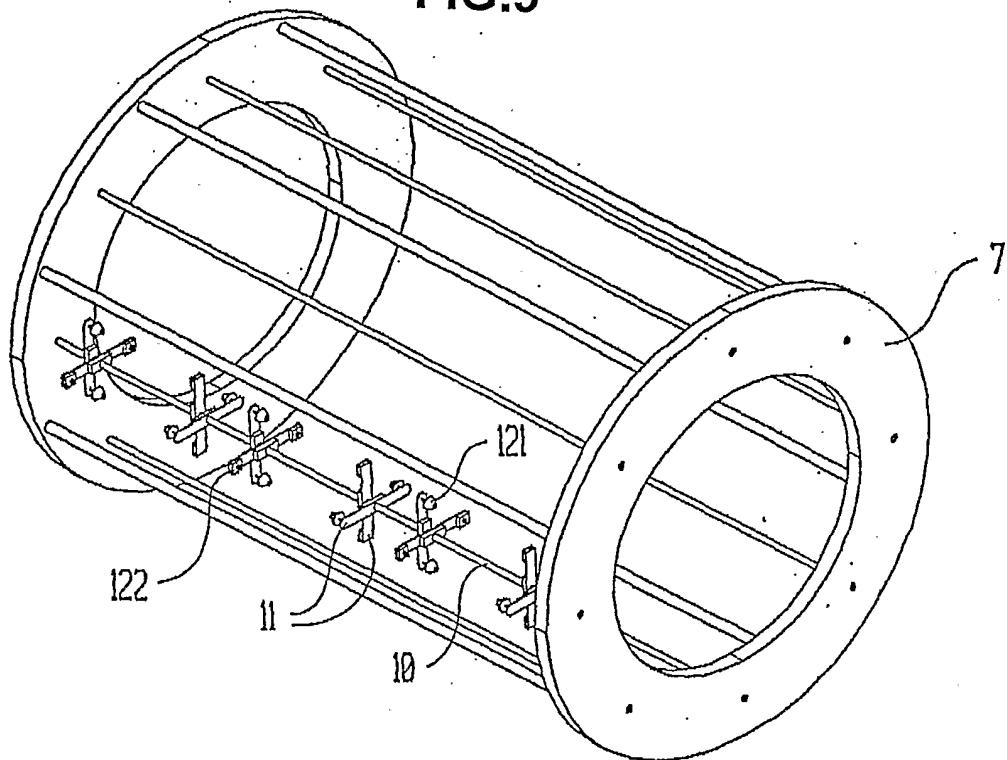


FIG.10

## INTERNATIONAL SEARCH REPORT

In national Application No  
PCT/CZ 01/00040

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C03C17/09 C03C17/00 A47G33/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C03C A47G

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

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

CHEM ABS Data, EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHEMICAL ABSTRACTS, vol. 106, no. 14, 6 April 1987 (1987-04-06) Columbus, Ohio, US; abstract no. 106810, MACIEJEWSKI, ANDRZEJ: "Method of and apparatus for metallizing glass bulbs, especially Christmas - tree ornaments" XP002182671 abstract & PL 128 356 B (BIURO KONSTRUKCYJNO-TECHNOLOGICZNE, KOSZALIN, POL.) 31 January 1984 (1984-01-31) ----	1-14
A	EP 0 270 024 A (TORGAU FLACHGLAS) 8 June 1988 (1988-06-08) page 9, line 4 - line 6; claims ----- -/--	1-14

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

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Date of the actual completion of the international search

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 93 02 893 U (BARTHEL, WOLFGANG) 15 April 1993 (1993-04-15) page 1 -page 3 -----	1-14

INTERNATIONAL SEARCH REPORT

In International Application No  
PCT/CZ 01/00040

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
PL 128356	B	NONE	
EP 0270024	A	08-06-1988 AT 76111 T DE 3779060 D1 DK 619887 A EP 0270024 A1 HU 47509 A2 YU 216287 A1	15-05-1992 17-06-1992 02-06-1988 08-06-1988 28-03-1989 31-10-1989
DE 9302893	U	DE 9302893 U1	15-04-1993