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(72) Inventor: **The designation of the inventor has not yet been filed**

(74) Representative: **Ratliff, Ismay Hilary
CarnaudMetalbox plc,
Downsview Road
Wantage, Oxfordshire OX12 9BP (GB)**

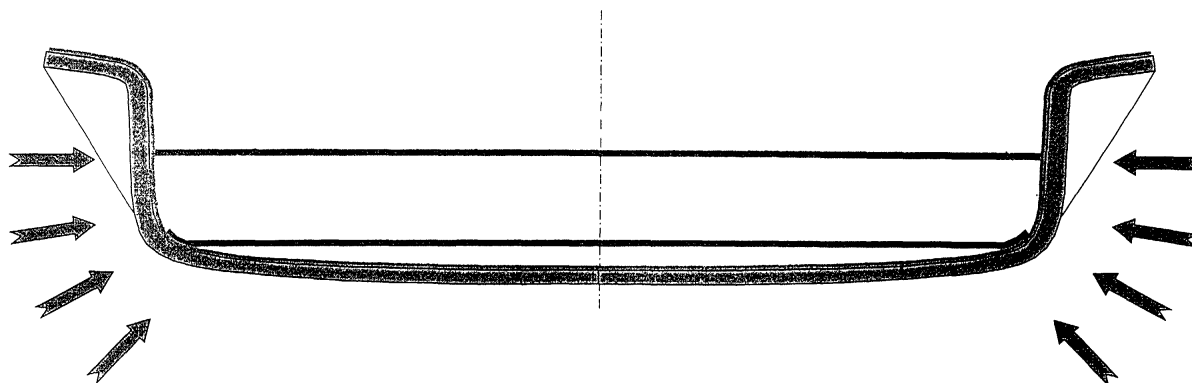
(71) Applicant: **Crown Cork & Seal Technologies
Corporation
Alsip, IL 60803-2599 (US)**

(54) **Crown for secondary fermentation**

(57) A crown cork (1) which is particularly for use in the secondary fermentation of sparkling wine such as champagne. The crown (1) has a laminated liner (15)

which is slightly larger in the diameter than the internal diameter of the metal shell (12). The liner (15) is pushed into the shell (12) and heat sealed into position by induction heating, for example.

fig. 4



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Description

[0001] This invention relates to crown corks and in particular, but not exclusively, to crowns of the type used for sealing bottles containing carbonated drinks such as

cider, water, fruit juices etc., or containing sparkling wine, such as champagne, whilst the wine undergoes secondary fermentation to make the champagne.

[0002] In the making of sparkling wine, still wine undergoes a secondary fermentation by bottling the wine with the addition of further sugar dissolved in wine with yeast added. The bottle is typically closed by a crown cork and, after about two months, an internal pressure is created and the wine undergoes a long and slow fermentation of at least 15 months, more usually about two to three years, and sometimes up to 10 years.

[0003] It is common practice to use crowns comprising a coated aluminium shell and a synthetic gasket/liner which is bonded to the shell by hot melt glue. The gasket/liner is of laminar structure, typically having a layer of foam polyethylene sandwiched between barrier films. The gasket/liner is slightly smaller than the shell and is centred and then pressed onto the glue. The barrier layer which contacts the hot melt glue can support the temperature of the glue, typically around 180°C. No heating of the other barrier layer occurs due to the insulating layer of foam polyethylene so that there is no damage of the barrier films. Clearly the integrity of the latter barrier layer is essential to maintain a high oxygen barrier and to avoid direct contact between the wine and the aluminium shell of the crown.

[0004] These existing crowns require centring of the liner. In addition, for measurement of pressure in the bottle for determining closure integrity and statistical quality controls, a needle is inserted through the crown. The needle is contaminated by passage through the glue and needs to be cleaned quite often.

[0005] Although it is known to provide crowns in which a liquid or viscous compound is placed in the shell and then formed around the interior of the crown by moulding tool pressure, such crowns use completely different techniques from the manufacture of crowns which use a solid laminated barrier structure. Clearly the capital outlay alone means that such techniques are not viable for addressing all the issues of the crowns of the present invention.

[0006] According to the present invention, there is provided a crown closure comprising a metal shell coated on its interior surface and a laminated gasket having an insulating layer and a barrier layer on at least one side of the insulating layer, in which the insulating layer bonds directly to the coating of the metal shell.

[0007] The insulating layer may be a polyethylene foam, or other material and type depending on the mechanical requirements of the layer, and the coating of the metal shell is selected to bond with the insulating layer. One such coating may be "PPG IP 3138/303" varnish, which has been specially developed to bond with

the polyethylene.

[0008] Usually, the laminated gasket has a barrier layer on both sides of the insulating layer so as to be symmetrical for use with the bulk feeding equipment which is generally used. The gasket is typically slightly larger than the internal diameter of the shell, such that the gasket is a "push fit" within the shell. This contrasts with the adhesive bond of prior art crowns in which the liner gasket is slightly smaller than the shell internal diameter and therefore requires centring in the shell and gluing in position to remain fixed to the shell.

[0009] According to a further aspect of the present invention, there is provided a method of manufacturing the crown closure, the method comprising fixing the gasket with the shell by heating the exterior surface of the shell adjacent the edge of the gasket where the insulating layer is exposed, whereby the gasket is welded in position within the shell by bonding between the insulating layer and the coating of the shell.

[0010] Heating is preferably by induction heating so that the barrier film is only exposed to the welding temperature of 125°C for a very short time, typically 1 to 2 seconds. Induction heating is preferred so that heating is limited to the metallic shell. The liner will only be heated by any conduction in the region of the weld and, as this is only for a very short time, the barrier film is not damaged in any way.

[0011] Alternatively, the method may comprise pre-heating of the shell prior to inserting the gasket in the shell.

[0012] A preferred embodiment of the invention will now be described, by way of example only, with reference to the drawings, in which:

Figure 1 is a schematic side section of a prior art crown;

Figure 2 is a schematic side section of the liner and shell, prior to insertion of the liner;

Figure 3 is a schematic side section of the liner after insertion in the shell;

Figure 4 is a schematic side section showing the heating process; and

Figure 5 is a schematic side section of the finished crown, after welding.

[0013] Figure 1 shows a prior art crown comprising an aluminium shell 2 having an internal coating 3 of PPG 4601 (vinyl type lacquer) for protection. A hot melt glue 4 bonds a synthetic gasket 5 to the inside of the shell 2. The gasket 5 comprises a polyethylene layer 8 sandwiched between barrier film layers 6 and 7. The laminated gasket 5 has a smaller diameter than the internal diameter of the shell, typically 29.2 mm and 29.5 mm respectively. The gasket is pressed into the shell as indicated by the arrow in figure 1 so that the glue 4 is spread into a layer between the gasket and the shell as shown.

[0014] The liner 15 of figure 2 is the same thickness

as that of the prior art crown, i.e. 2.3 mm, but, in contrast, the new liner has a larger external diameter than the internal diameter of the shell 12 - typically 29.6 mm and 29.5 mm respectively. The gasket 15 is push fitted into the shell 12 without any glue, where it is simply wedged in position by virtue of the difference in diameters, as shown in figure 3.

[0015] The liner 15 comprises a polyethylene central layer 18 sandwiched between barrier layers 16 and 17, as in the prior art gasket. The shell 12 is of metal, generally aluminium but alternatively tinplate or stainless steel and has a special internal coating suitable for sealing with the polyethylene layer 18. As shown in figure 4, this weld is formed by induction heating the exterior of the shell in the region indicated by the large arrows. Natural pressure between the polyethylene gasket and the varnish coating of the shell ensure that welding only takes place at the edge of the liner gasket. By using induction heating, any contact with the barrier film, which could be damaged is avoided.

[0016] Figure 5 shows the final crown with the liner fixed by induction heating of its perimeter as indicated by welded areas 18. The barrier layer 17 is unaffected by the welding as it is never heated. Any heating of lower barrier layer 16 is very limited in duration so that the film is not damaged.

ing between the insulating layer and the coating of the shell.

7. A method according to claim 6, in which the shell is of conducting material and heating is by induction heating.

Claims

1. A crown closure comprising a metal shell coated on its interior surface and a laminated gasket having an insulating layer and a barrier layer on at least one side of the insulating layer, in which the insulating layer bonds directly to the coating of the metal shell.
2. A crown according to claim 1, in which the insulating layer is a polyethylene and the coating of the metal shell is selected to bond with the insulating layer.
3. A crown according to claim 2, in which the coating is "PPG IP 3138/303" varnish.
4. A crown according to any one of claims 1 to 3, in which the laminated gasket has a barrier layer on both sides of the insulating layer.
5. A crown according to any one of claims 1 to 4, in which the gasket is slightly larger than the internal diameter of the shell.
6. A method of manufacturing the crown closure of any one of claims 1 to 5, the method comprising fixing the gasket with the shell by heating the exterior surface of the shell adjacent the edge of the gasket where the insulating layer is exposed, whereby the gasket is welded in position within the shell by bond-

FIG. 1 (Prior Art)

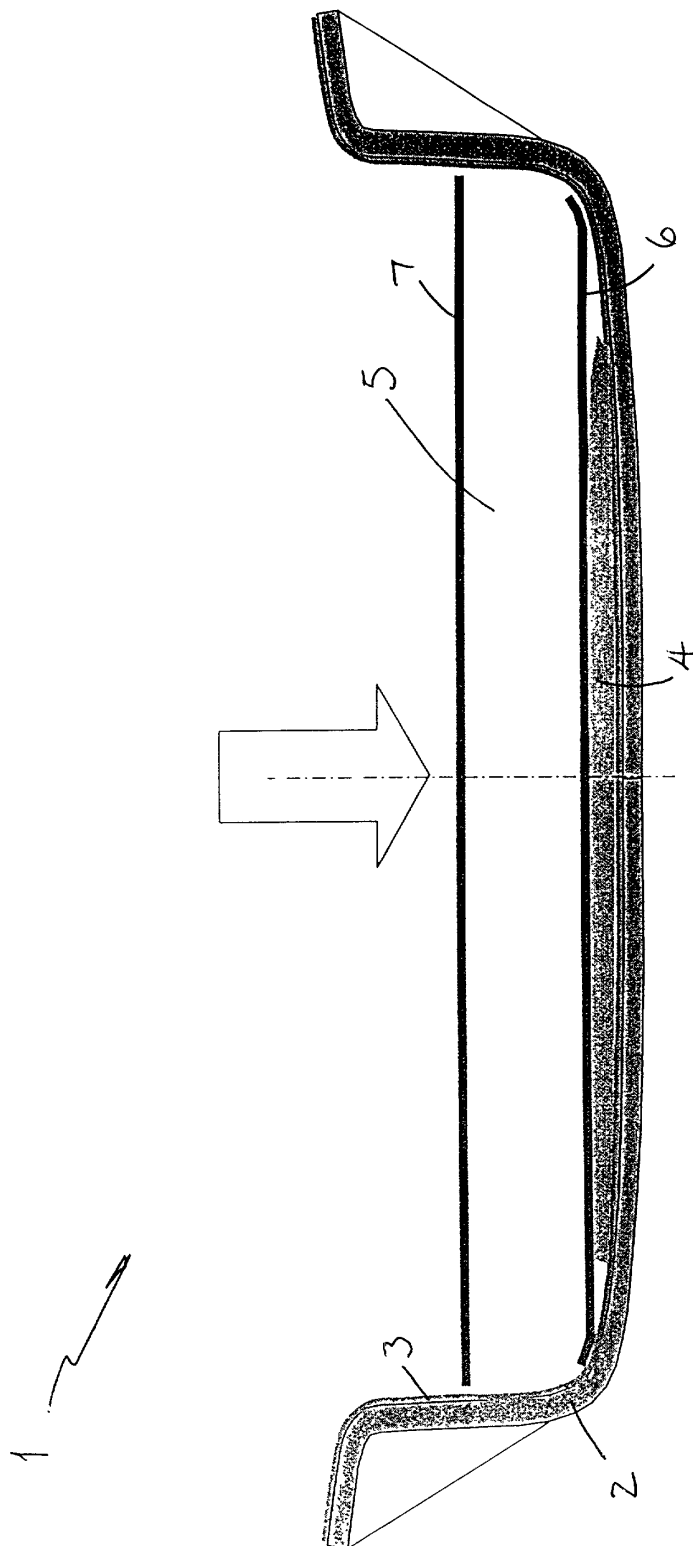


FIG. 2

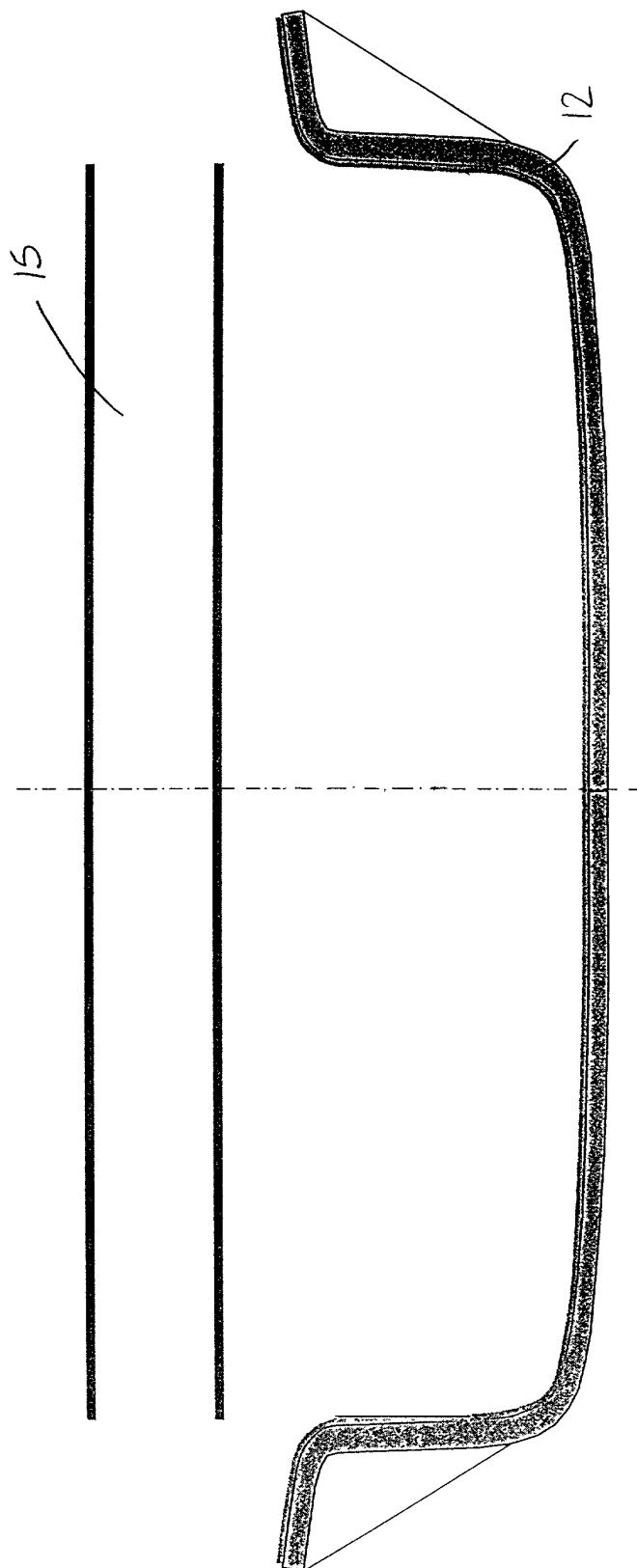


Fig. 3

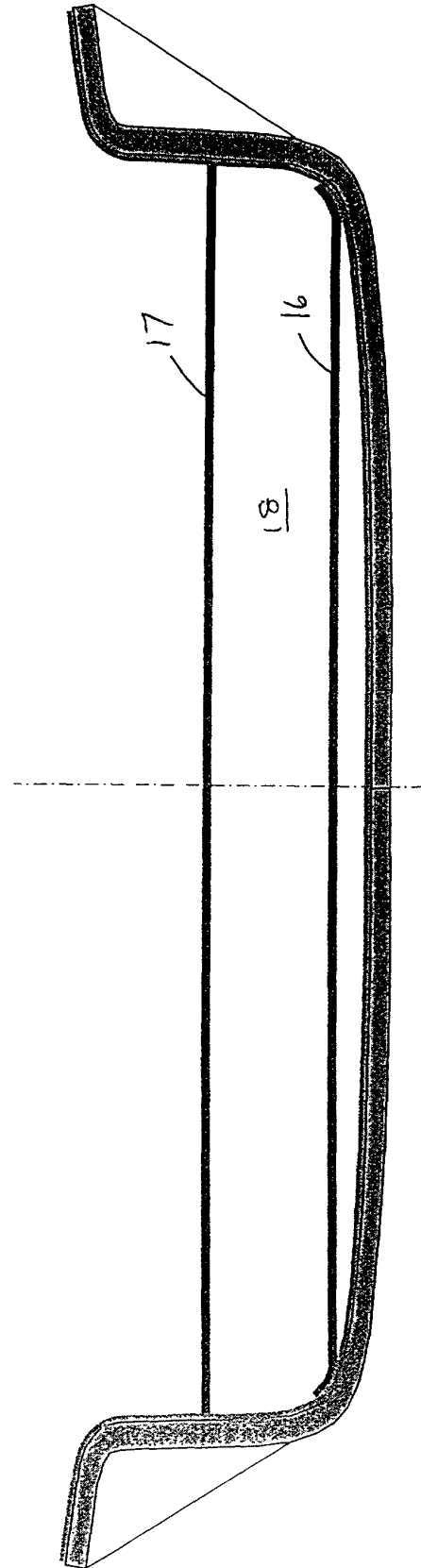


FIG. 4

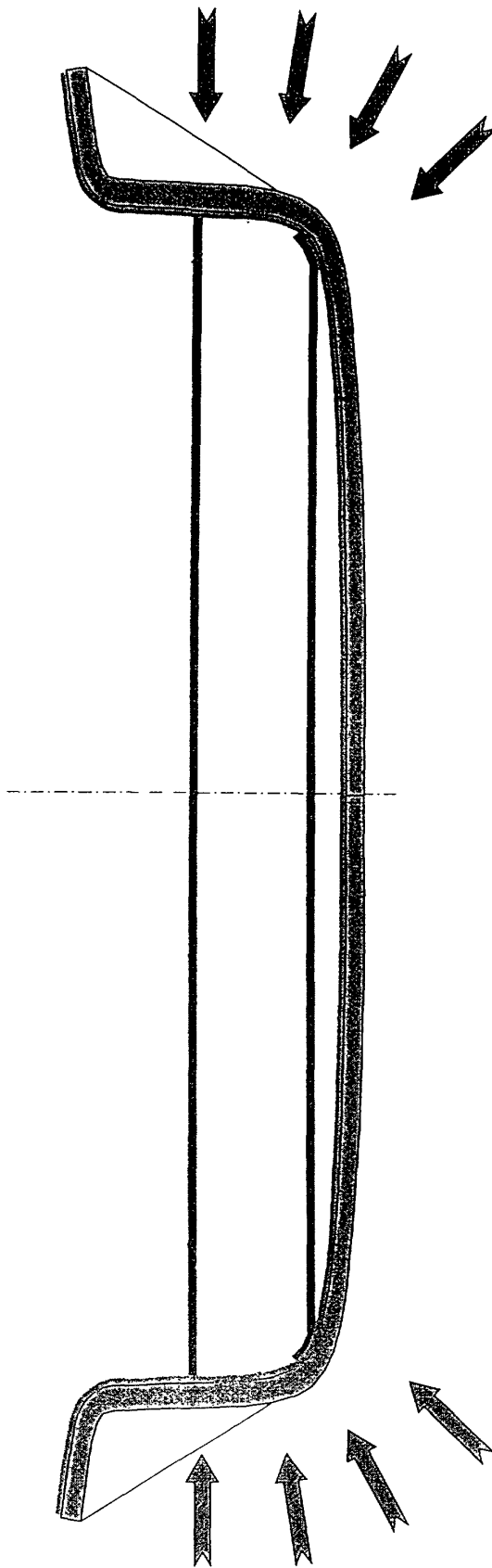
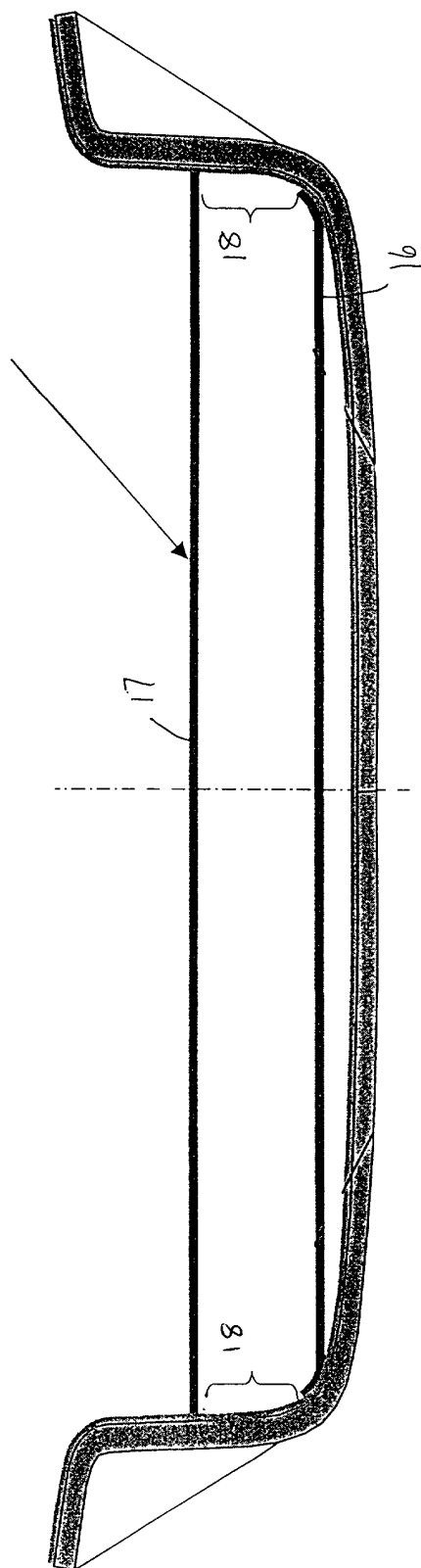


FIG. 5





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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 2699

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 1 956 481 A (WARTH ALBIN H) 24 April 1934 (1934-04-24) * page 3, line 128 - page 4, line 25 * * figure 2 *	1	B65D41/12 B65D51/00
Y	-----	2,6,7	
Y	US 4 269 321 A (ICHINOSE ISAO ET AL) 26 May 1981 (1981-05-26) * column 10, line 57 - column 11, line 23 * * column 14, line 49 - column 15, line 6 * * figures 1-3 *	2,6,7	
A	-----	1	
X	US 2 081 246 A (MCMANUS CHARLES E) 25 May 1937 (1937-05-25) * page 2, column 1, line 59 - column 2, line 10 * * figures 1-9 *	1	
A	-----	6	
A	US 3 447 710 A (BLAIR STANLEY A) 3 June 1969 (1969-06-03) * column 3, line 15 - line 31 * * column 4, line 71 - column 5, line 7 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D
A	US 3 087 639 A (FISCHER ALBERT M) 30 April 1963 (1963-04-30) * column 5, line 11 - line 23 * * figures 17-20 *	1,5	
A	GB 1 109 849 A (CHEMICAL PRODUCTS CORP) 18 April 1968 (1968-04-18) * page 1, line 76 - page 2, line 20 * * page 3, line 91 - page 4, line 7 * * claims 1,5 * * figures 1-8 *	1,6	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 14 September 2001	Examiner Schultz, O
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 30 2699

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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14-09-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 1956481 A	24-04-1934	BE 402348 A	
		FR 772632 A	31-10-1934
		GB 429396 A	29-05-1935
US 4269321 A	26-05-1981	JP 1170288 C	17-10-1983
		JP 54074831 A	15-06-1979
		JP 58000385 B	06-01-1983
		AR 223333 A	14-08-1981
		AU 521996 B	13-05-1982
		AU 4192878 A	07-06-1979
		BR 7807849 A	31-07-1979
		CA 1108973 A	15-09-1981
		DE 2851642 A	07-06-1979
		ES 475464 A	16-01-1980
		FR 2409856 A	22-06-1979
		GB 2010177 A, B	27-06-1979
		IT 1101447 B	28-09-1985
		NL 7811675 A	31-05-1979
		PH 25393 A	03-06-1991
		SE 7812032 A	30-05-1979
		US 4370190 A	25-01-1983
US 2081246 A	25-05-1937	NONE	
US 3447710 A	03-06-1969	NONE	
US 3087639 A	30-04-1963	US 3211316 A	12-10-1965
GB 1109849 A	18-04-1968	US 3265785 A	09-08-1966
		US 3339774 A	05-09-1967
		BE 666293 A	03-01-1966
		FR 1452120 A	08-12-1966

EPO FORM P4459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82