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Europäisches Patentamt  
European Patent Office  
Office européen des brevets

(11) Publication number:

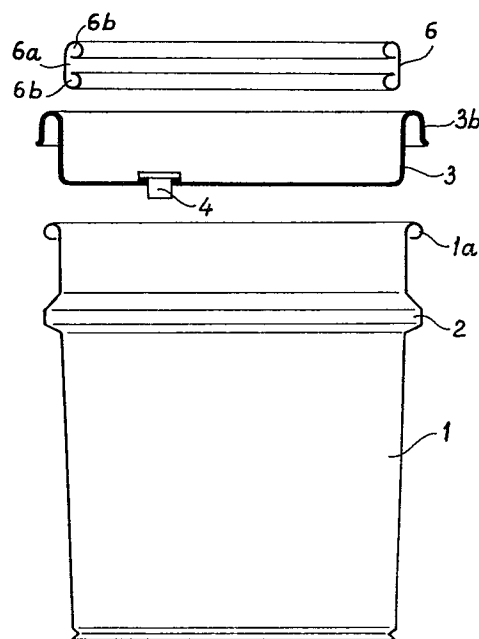
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**A1**

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# EUROPEAN PATENT APPLICATION

(21) Application number: **80200624.7**(51) Int. Cl.<sup>3</sup>: **B 65 D 45/32**(22) Date of filing: **30.06.80**(30) Priority: **09.07.79 NL 7905347**(71) Applicant: **KONINKLIJKE EMBALLAGE INDUSTRIE VAN LEER B.V., P.O. Box 25, NL-1180 AA Amstelveen (NL)**(43) Date of publication of application: **21.01.81**  
**Bulletin 81/3**(72) Inventor: **Streefkerk, Willem Lodewijk, Couwenhoven 6202, NL-3703 HP Zeist (NL)**(84) Designated Contracting States: **BE DE FR GB IT NL**(74) Representative: **van der Beek, George Frans, Ir. et al, Nederlandsch Octrooibureau P.O. Box 29720, NL-2502 LS The Hague (NL)**(54) **A method for packing and packing for liquid, pasty and powdery substances.**

(57) A method for the packing of liquid, pasty and powdery substances, in which a container (1) made of sheet metal is sealed by means of a cover (3) with the aid of a metal sealing ring (6), which is placed inside the cover (3) and which is deformed outwards in the form of a through, so that the cylindrical edge of the cover (3) as well as the corresponding part of the container (1) are deformed outwards and sealed with respect to each other.



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A method for packing and packing for liquid, pasty and powdery substances.

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This invention relates to a method for the packing of liquid, pasty and powdery substances, in which a container made of sheet metal is sealed by means of a cover, said container comprising a substantially cylindrical body and a bottom, said body at its free end being provided with a torus-shaped edge, said cover comprising a bottom and a substantially cylindrical raised edge, said edge at its free end being provided with an edge bent over, whereby after placing the cover in the container, a radial force is exerted on the inner side of the raised edge of the cover, said force acting omni- laterally outwards, whereby the raised edge of the cover and the body portion of the container corresponding with said edge are deformed outwards in the form of a trough.

Such a method is known from Australian Patent Specification 53,760. Before the cover is placed on the container, the body of said container is completely open at one end. The containers can be nested into each other and with separate covers transported to a firm where the containers are being filled, e.g. at a paint factory. The containers which are fully open at the top are very easy to fill. When the filling has been completed, the cover is placed on the container. At the known method a V-shaped trough must be preformed in the cylindrical body of the container, in which trough a packing ring is arranged. After placing the cover the raised edge of the cover is pressed into the ring. In spite of the packing ring provided, this kind of packing cannot withstand very rough handling and storage. Especially when the filled packings fall, which happens now and again, it was found that leakages occur.

It is the object of this invention to provide a method and a light, economic packing, which can be closed and opened in a simple manner, in which no leakages occur and in which the cover can still be removed and used again by the customer in a simple manner.

According to the invention, the method is characterized in that a metal sealing ring is placed inside the cover before the radial force acting omnilaterally outwards is exerted, said sealing ring being subjected to said omnilateral radial force acting outwards.

5 In this way a packing is obtained which even during extremely rough handling will not leak and which, in addition, cannot be opened fraudulently without leaving visible tracks. Further a cover made of synthetic material, may be used.

10 If required, a conventional pouring means which can be sealed may be provided, and with the aid of said means the user can pour the contents without removing the cover.

According to the invention, the packing for liquid, pasty and powdery substances, comprising a container made of sheet metal with a substantially cylindrical body and a bottom, said body at its free end being provided with a torus-shaped edge, and a cover provided with a bottom and a substantially cylindrical raised edge, 15 said edge at its free end being provided with an edge bent over, said cover in sealed condition of the packing seating tightly on the inner side of the container body with its raised edge and with its edge bent over enclosing the torus-shaped edge of the container, 20 whereby packing material is provided between cover and container, is characterized in that a sealing ring made of sheet metal is disposed inside the cover and at least in sealed condition of the packing, the sealing ring, the raised edge of the cover and the corresponding body portion are deformed outwards in the form of a 25 trough.

Other advantages and characteristics will now be described more in detail with reference to the accompanying drawings, illustrating two embodiments.

30 Fig. 1 is an axial section of a container, a cover of synthetic material, and a sealing ring before the container is sealed, according to the first embodiment;

Fig. 2 is a part-sectional view of the first embodiment after the sealing of the container;

Fig. 3 and 4 are representations of a second embodiment corresponding with fig. 1 and 2; and

Fig. 5 corresponds to fig. 4 and shows a third embodiment.

5 In the first embodiment, illustrated in fig. 1 and 2, a conventional container is indicated by reference numeral 1. The container is made of e.g. steel plate, tin plate or aluminium with a sheet thickness of e.g. 0.3 mm. Containers of this kind are used at a large scale in practice. In the condition as illustrated in fig. 1 they are sent to a firm where they are being filled, e.g.  
10 with paint, oil and the like.

The edge 2 does not only give rigidity to the wall, but it makes it also possible to nest a number of empty containers such that they will not jam. The edge will prevent the filled container from being crushed when it falls.

15 In the first embodiment illustrated a synthetic cover 3 is used; in this case, said cover is provided with a conventional pouring means 4, e.g. a screw cap.

When the container 1 has been filled, the cover 3 is secured to the container 1 in such a manner that it is impossible to open  
20 said container fraudulently and the filled container will survive rough handling and storage.

The cover 3, illustrated in fig. 1, has a flat bottom, however, the bottom can also be provided with a corrugated edge 3a (see fig. 2). It is thus possible to take up a change in volume when the  
25 container becomes deformed. In addition, if the filled container falls, a cover of this kind can absorb a great deal of energy, whereby the risk of serious damage to the container is considerably reduced.

The container 1 and cover 3 are provided with a torus-shaped edge 1a and a downward-facing edge 3b respectively.

30 Before the cover 3 is placed on the container 1, packing material 5 is provided in the bottom of edge 3b. The packing material is not a must for sealing the container 1 but it prevents leakage should the filled and closed container fall. The packing material 5 is relatively high. When the container 1 has been sealed, the height of the  
35 material is reduced to half at the most.

In order to seal the container 1, a metal sealing ring 6 is disposed in cover 3 after said cover has been placed on the container. The sealing ring 6 comprises a cylindrical body 6a and two inwardly directed beaded edges 6b.

5       An expansion means is disposed inside said sealing ring 6, said means consisting of e.g. a number of fingers 7 which can move radially outwards against spring action, one of which being indicated by chain-dotted lines in fig. 2; said means can also consist of e.g. a cone which is being pressed against the inner ends of  
10       fingers 7. The fingers 7 will then move radially outwards and deform the sealing ring 6, the raised edge of cover 3 and the wall of container 1 into the shaped illustrated in fig. 2.

When the expansion means has been removed, a seal is obtained which, even under the most unfavourable conditions, is tight and  
15       remains tight. Opening the container fraudulently without leaving visible tracks behind is not possible. However, the user can remove the cover without damaging it by deforming and removing the sealing ring 6 with an appropriate tool. Afterwards, the cover can be placed on the container again, if required, by means of a snap-movement  
20       but, of course, without using the destroyed sealing ring.

In the first embodiment illustrated, the raised edge of the cover 3 and the wall of the upper portion of the container 1 are at first cylindrical. The more or less sharp trough-shaped protrusion occurs when the container is closed (see fig. 2).

25       However, it is also possible to pre-form the protrusions slightly (see fig. 3).

Fig. 3 and 4 illustrate a second embodiment which substantially corresponds with the first embodiment.

The differences between the first and the second embodiment are  
30       that the upper edge 3b of the cover does not continue so far as the edge in the first embodiment. This is possible because the packing material 5 is now disposed in the preformed trough-shaped protrusion in the wall of container 1.

The metal sealing ring 6 comprises a cylindrical body 6a, an outwardly  
35       directed upper beaded edge 6b and an inwardly directed lower beaded edge 6d.

When the container has been sealed the upper beaded edge 6c rests on the upper edge 3b of the cover 3. When the filled container falls upside down, the sealing becomes even stronger because the beaded edge 6c will press on the cover edge 3b; said cover edge may be thicker than the raised edge. The bottom can also be thicker in parts, especially when filled containers have to be stacked.

Fig. 5 shows a third embodiment, corresponding substantially to the second embodiment. The lower edge 6d and the upper edge 6c are more open, thus channel-shaped, whereby the upper edge in closed position extends over the upper edge 3b of the cover 3. In this way a still better packing is obtained.

During stacking of the containers at the first embodiment the bottom of the upper container 1 rests on edge 6b, at the second embodiment on the lower edge 6d or in some cases on the upper edge 6c depending on the chosen diameter of the bottom. At the third embodiment the bottom edge rests in the channel-shaped edge 6d.

Preferably the diameter of the bottom is chosen equal to the diameter of the edge 6b or 6d.

During tests it was found that containers of 20 litres capacity and with a wall thickness of 0.3 - 0.4 mm remain closed when the height of all is 0.8 mm. A container of 25 litres capacity and with a wall thickness of 0.4 mm remains closed when the height of fall lies between 1.2 and 1.4 m.

The container according to the invention is suitable for contents with a high and low viscosity.

The flanks of the stiffening and stacking edge 2 are preferably asymmetric.

C L A I M S

1. A method for the packing of liquid, pasty and powdery substances, in which a container made of sheet metal is sealed by means of a cover, said container comprising a substantially cylindrical body and a bottom, said body at its free end being provided with a torus-shaped edge, said cover comprising a bottom and a substantially cylindrical raised edge, said edge at its free end being provided with an edge bent over, whereby after placing the cover in the container, a radial force is exerted on the inner side of the raised edge of the cover, said force acting omnilaterally outwards, whereby the raised edge of the cover and the body portion of the container corresponding with said edge are deformed outwards in the form of a trough, characterized in that a metal sealing ring is placed inside the cover before the radial force acting omnilaterally outwards is exerted, said sealing ring being subjected to said omnilateral radial force acting outwards.

2. A method according to claim 1, characterized in that the raised edge of the cover and the corresponding body portion of the container are pre-formed slightly in the form of a trough.

3. A packing for liquid, pasty and powdery substances, comprising a container made of sheet metal with a substantially cylindrical body and a bottom, said body at its free end being provided with a torus-shaped edge, and a cover provided with a bottom and a substantially cylindrical raised edge, said edge at its free end being provided with an edge bent over, said cover in sealed condition of the packing seating tightly on the inner side of the container body with its raised edge and with its edge bent over enclosing the torus-shaped edge of the container, whereby packing material is provided between cover and container, characterized in that a sealing ring made of sheet metal is disposed inside the cover and at least in sealed condition of the packing, the sealing ring, the raised edge of the cover and the corresponding body portion are deformed outwards in the form of a trough.

4. Packing according to claim 3, characterized in that the sealing ring comprises a trough-shaped middle portion

being deformed outwards and two inwardly directed torus-shaped end edges, in which the lower torus-shaped edge rests against the bottom of the cover.

5        5. A packing according to claim 3, c h a r a c t e r i z e d i n that the sealing ring consists of a middle part comprising a portion being deformed outwards in the form of a trough and two channel-shaped end edges, in which the lower one directed inwards rests against the bottom of the cover and the upper one directed outwards rests on the edge of the cover bent over.

10       6. A packing according to claim 5, c h a r a c t e r i z e d in that the upper edge directed outwards extends over the bent over edge of the cover.

15       7. A packing according to claims 3,4, 5 or 6, c h a r a c - t e r i z e d i n that the diameter of the bottom of the container is substantially the same as the diameter of the edge of the sealing ring on which the bottom rests in stacked position.

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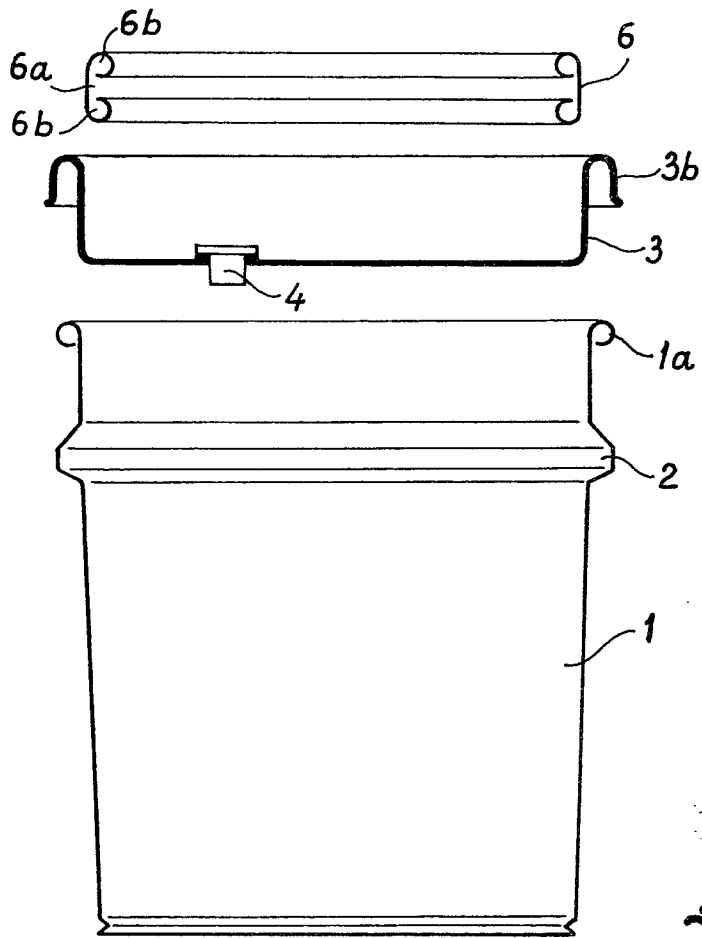


fig-1

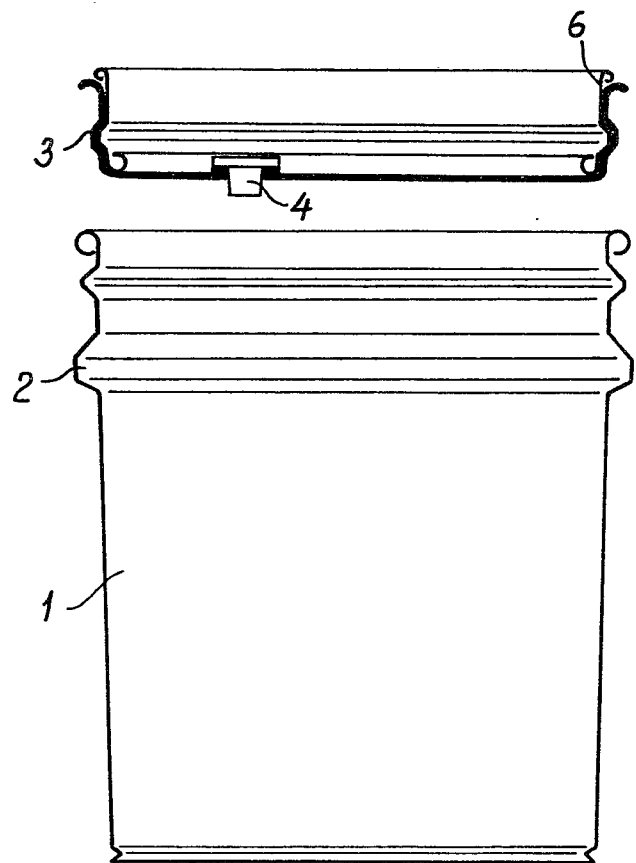


fig-3

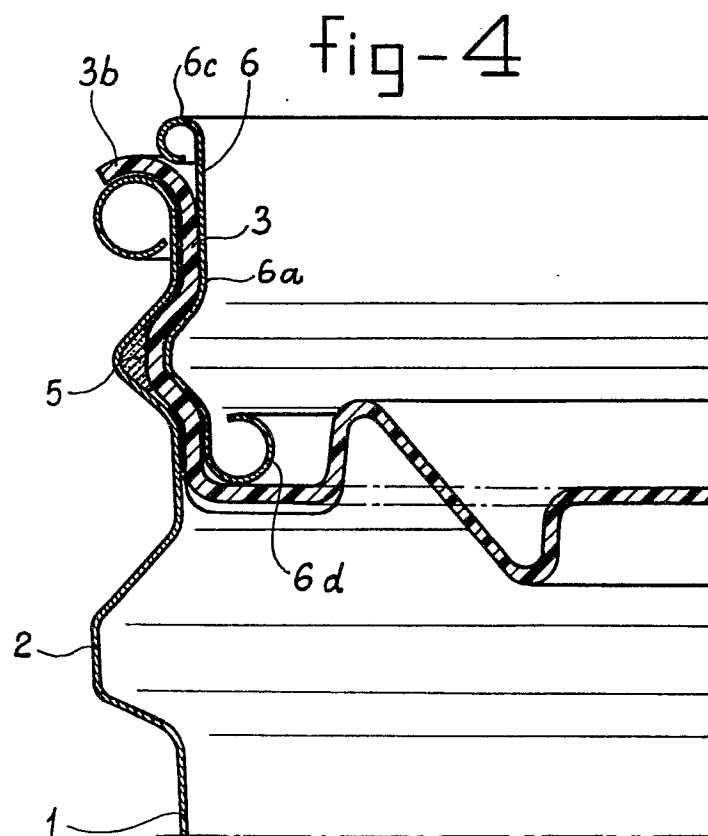
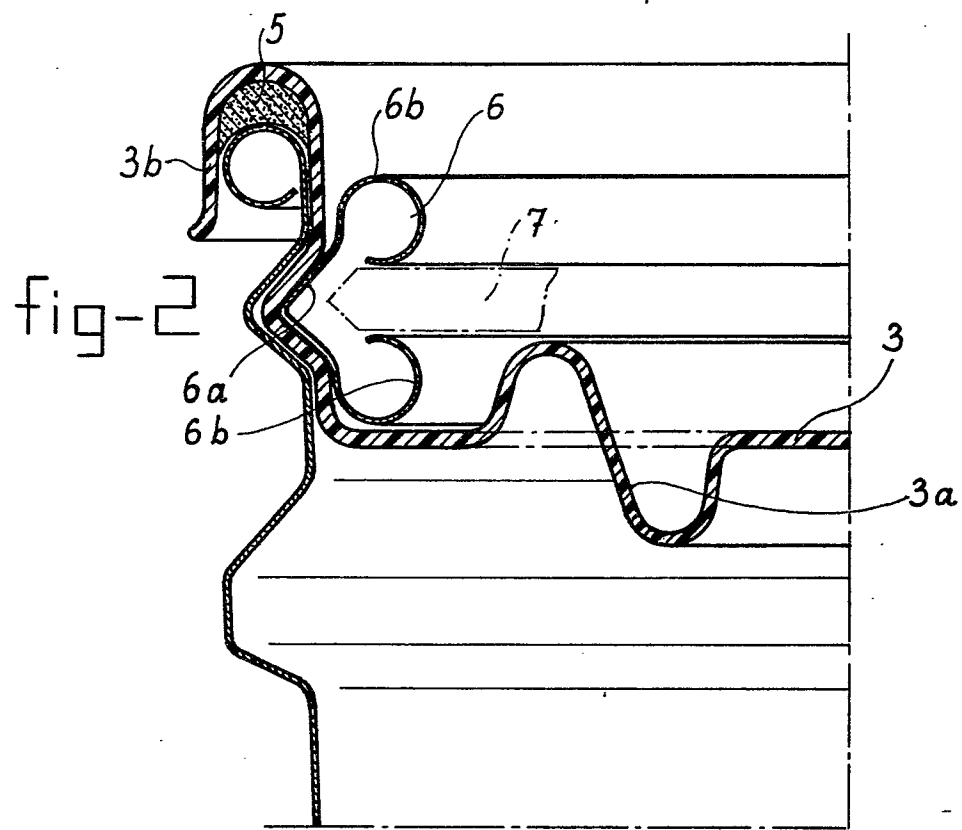
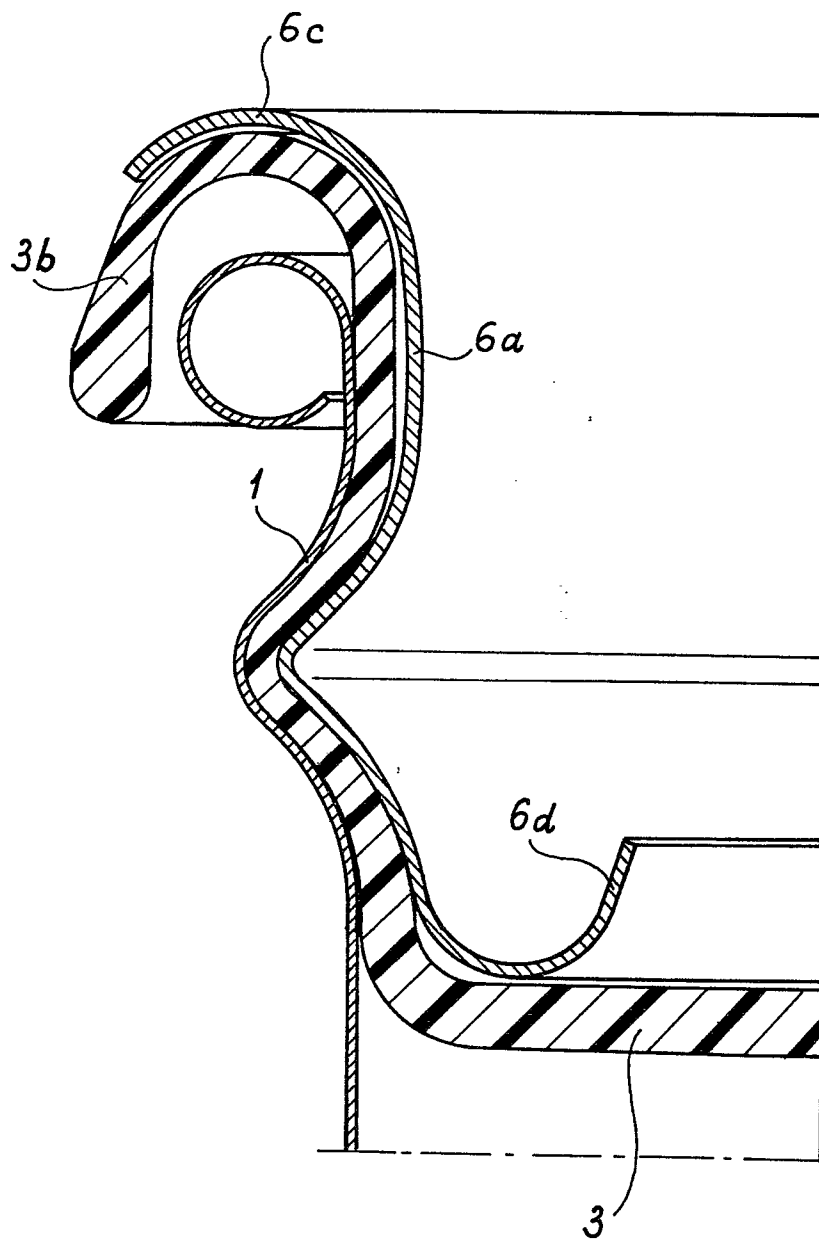


fig-5





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# EUROPEAN SEARCH REPORT

0022593

Application number

EP 80 20 0024

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                            |                                                                                   |                                                | CLASSIFICATION OF THE APPLICATION (Int. Cl.)                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category                                                                                       | Citation of document with indication, where appropriate, of relevant passages     | Relevant to claim                              |                                                                                                                                                                                                                                                                            |
|                                                                                                | <u>CH - A - 328 708 (FRAME)</u><br>* Entire document *<br>& NL - C - 89 295<br>-- | 1,3                                            | B 65 D 45/32                                                                                                                                                                                                                                                               |
|                                                                                                | <u>FR - A - 1 401 348 (LAUBIER)</u><br>* Entire document *<br>--                  | 1,3                                            |                                                                                                                                                                                                                                                                            |
| AD                                                                                             | <u>AU - A - 467 047 (RHEEM AUSTRALIA LTD)</u>                                     | 1                                              | TECHNICAL FIELDS SEARCHED (Int. Cl.)                                                                                                                                                                                                                                       |
| A                                                                                              | <u>US - A - 3 979 015 (REYNOLDS METALS COMP.)</u>                                 | 1                                              |                                                                                                                                                                                                                                                                            |
| A                                                                                              | <u>GB - A - 714 978 (ET GABRIELS)</u><br>-----                                    | 1                                              | B 65 D                                                                                                                                                                                                                                                                     |
|                                                                                                |                                                                                   |                                                | CATEGORY OF CITED DOCUMENTS                                                                                                                                                                                                                                                |
|                                                                                                |                                                                                   |                                                | X: particularly relevant<br>A: technological background<br>O: non-written disclosure<br>P: intermediate document<br>T: theory or principle underlying the invention<br>E: conflicting application<br>D: document cited in the application<br>L: citation for other reasons |
| <input checked="" type="checkbox"/> The present search report has been drawn up for all claims |                                                                                   |                                                | &: member of the same patent family, corresponding document                                                                                                                                                                                                                |
| Place of search<br>The Hague                                                                   |                                                                                   | Date of completion of the search<br>20-10-1980 | Examiner<br>BAERT                                                                                                                                                                                                                                                          |