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(54) **CONTAINER**

(57) A container comprises a plastic vessel (102), a plastic base (104), and a collar (106) to join the vessel (102) with the base (104). A method of manufacturing a plastic container comprises forming a vessel (102) and

a base (104) by rotational casting, placing the formed vessel (102) in the formed base (104), and joining the vessel (102) placed in the base with the base (104) by means of a collar (106).

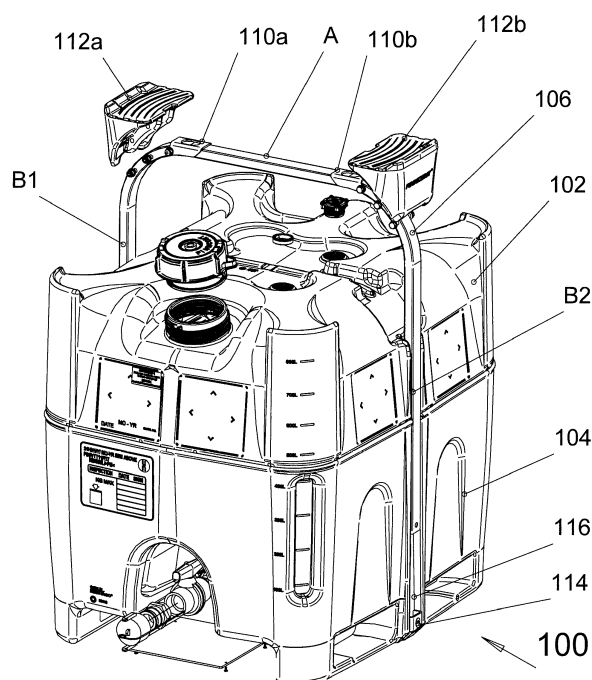


FIG. 1

Description

Field of the invention

[0001] The invention relates to a container and, in particular, to a plastic container.

Background

[0002] Known plastic containers are often provided with a metal cage having a plastic vessel therein. An example of such known plastic containers is a Finncont PF800 plastic container. The metal cage supports the plastic vessel against internal overpressure in the vessel. The metal cage accounts for a significant part of the weight of the container. Production and assembly of such a metal cage around the plastic vessel require additional work phases while manufacturing the plastic container, which makes the plastic container slower to manufacture.

Brief description of the invention

[0003] An object of the invention is to solve or alleviate at least some of the aforementioned drawbacks.

[0004] The subject matter of the present invention is a container and a method as disclosed in the independent claims. Preferred embodiments of the invention are disclosed in the dependent claims.

[0005] The present invention enables a plastic container to be provided with a light-weight yet firm structure. It is now possible to manufacture the plastic container faster.

List of figures

[0006] The invention is now described in closer detail in connection with preferred embodiments and with reference to the accompanying drawings, in which:

Figure 1 shows a structure of a container according to an embodiment;

Figure 2 illustrates an upper surface of a vessel of a container according to an embodiment; and

Figure 3 is a side view illustrating a container according to an embodiment.

Detailed description of the invention

[0007] In the following, containers according to some embodiments will be described with reference to Figures 1 to 3, in which like reference numerals and markings identify like elements.

[0008] A container 100 comprises a plastic vessel 102, a plastic base 104, and a collar 106 to join the vessel with the base. The collar supports the vessel with respect to the base, serving as a joining element for the vessel and the base. Liquid may be stored in the vessel to be transported in the container. When the vessel is provided

with contents, for instance a liquid, the collar may support the vessel inter alia against fluctuations in hydrostatic pressure of the contents in the vessel and against the mass of the contents in the vessel. The collar further enables support for the vessel while the container is being handled. When handling the container, the container may be moved for instance by means of a truck loader or a pump carriage from one place to another, the container may be stacked on top of another container, or another container may be stacked on top of the container.

[0009] Preferably, the collar is visible on the surface of the container, enabling the condition of the collar to be checked readily. This enables defective collars to be detected and the collar or the container to be replaced.

[0010] Preferably, the collar runs in the middle of an outer surface of the container. The outer surface of the container may be formed by outer surfaces of the vessel and the base. The outer surfaces may comprise vertical sides interconnected with one another at corners. The collar may be placed to run across the container, in the middle of opposite sides of the container such that the collar bisects the span of the opposite sides of the container. This enables the support structure of the container to be implemented by using one collar only and the support structure of the container to be kept simple.

[0011] The vessel is mounted on top of the base. The base enables the vessel to be supported on the ground, floor or another surface on which the container stands. The base is open on top, leaving the upper surface of the vessel free. Thus, one or more filling opening and/or fitting located on the upper surface of the vessel remain visible.

[0012] The base may extend upwards, at least partly around the sides of the vessel, the base outlining and supporting the vessel on its sides. In such a case, in the container the vessel resides at least partly inside the base and the sides of the container are formed by the side surfaces of the vessel and the base, at least one collar being mounted in the middle of the opposite sides thereof. The base may extend for instance on the sides of the vessel halfway across the height thereof.

[0013] The vessel and the base may be made of plastic by rotational casting. The collar enables the material thickness of the rotational-cast parts to be kept smaller than without a collar. Thus, the collar may reduce the material demand in the manufacture of the vessel and the base.

[0014] Preferably, the vessel and the base are made of a thermoplast suitable for storing liquids, such as water, nitrogen and/or acetic acid. An example of a thermoplast is a rotational-cast polyethylene plastic. The container is a UN type approved IBC (Intermediate Bulk Container) package, i.e. a medium-size transport container (450-3 0001) for dangerous or harmless liquids.

[0015] The vessel and the base are located on top of one another such that the collar has a section A exceeding the upper surface of the vessel, and sections B1, B2 extending, on the side surfaces of the vessel, from the

section exceeding the upper surface of the vessel towards the base. The collar sections extending towards the base are located on the sides of the vessel and the base, on opposite sides of the container. The collar sections located on the opposite sides of the container are located on the opposite side surfaces of the container which comprise side surfaces of the vessel and the base. Thus the collar supports the container on the opposite sides of and from above the container.

[0016] In an embodiment, the material of the collar is stainless steel, providing the vessel and the base with necessary support, but other materials may also be used.

[0017] In an embodiment, the collar may be flat or tubular in its cross-section. A profile of the cross-section of a tubular collar may be angular or circular. An angular profile may be rectangular, for instance. It is to be noted that when manufacturing a container, the collar may be made by bending the collar material, such as a stainless steel tube or strip, so as to form a collar which extends from the upper surface to the side surfaces of the vessel. In such a case, because of the bending, the profile may change at points of bending. It is possible that instead of bending, the collar may be formed from separate parts extending on top of the vessel and on the sides of the container, which may be joined together by welding, screws, bolts or notched joints. Manufacturing the collar by bending enables work phases required by joining the separate parts together to be avoided.

[0018] In an embodiment, the collar 106 comprises on the upper surface of the vessel at least two spaced apart fastening points 110a, 110b for fastening lifting means to a container for lifting the container. The fastening points are arranged to be suitable for being fastened to the fastening means. Examples of fastening means comprise at least one of the following: chains and hooks.

[0019] In an embodiment, the collar comprises a support arrangement 112a, 112b at edges of the vessel for supporting from below another container to be placed on top of the container. This enables a plurality of containers to be stacked on top of one another. The support arrangement may comprise support pieces, a bed or a frame which may be manufactured from polyethylene or steel. The support pieces may be manufactured by casting, edging or welding. The support arrangement, for instance support pieces, is preferably arranged to provide support on opposite edges of the upper surface of the vessel so as to firmly support the other container. The support arrangement may provide support on all edges of the upper surface. In an embodiment, a space is provided between the support arrangement and the vessel for an RFID (Radio Frequency Identification) tag. The space may be formed as a recess in the upper surface of the vessel and/or in the support arrangement.

[0020] In an embodiment, in front of each support piece placed on the edges of the upper surface of the vessel, towards an opposite edge, is provided a fastening point for fastening lifting means to the container for lifting the container.

[0021] In an embodiment, the base comprises fastening parts 114 on oppositely residing sides of the base for fastening the collar to the base. Opposite ends of the collar may thus be fastened to the base, in which case the collar joins the base and the vessel into one entity. This enables the vessel and the base to be lifted by fastening the fastening means in the fastening points provided in the collar. The weight of a container stacked on top of another container is transmitted through the collar to the fastening parts, enabling the load being exerted from the stacked-on container to the vessel to be distributed over the base. Preferably, the fastening parts may extend from the sides of the base to a lower surface of the base. Thus, the collar fastened to the fastening parts supports the container from above, on the sides and from the bottom at the edges of the base, where the collar is fastened by the fastening parts.

[0022] In an embodiment, the container comprises a groove 116 in which the collar is mounted. The groove may be formed from grooves in the vessel and the base, which meet when the vessel is mounted in the base. The collar is thus allowed to run in a groove between the vessel and the base, and the collar stays in place around the vessel and the base. The groove may preferably run across the entire surface outside the base of the vessel to the base. The vessel and the base may be provided with several grooves, in which case the container may be provided with several collars. With respect to one another, the grooves may run parallelly or perpendicularly around the container. A groove may be a groove in the outer surfaces of the vessel and the base, or a so-called casing hidden inside the structure of the vessel and the base. The groove may encircle the entire container.

[0023] It is to be noted that the container is not necessarily provided with a groove for the collar. It is possible to mount the collar in the container also as a so-called surface mounting, in which case no groove is necessary.

[0024] In an embodiment, the container may be provided with several collars when a groove runs between the vessel and the base on each side of the container. Thus, for instance a container with four sides may be provided with two collars that intersect on top of the vessel.

[0025] In an embodiment, the collar or collars completely encircle(s) the vessel and the base. In such a case, instead of two fastening parts, one fastening part can be used for fastening the collar to the base. A fastening point is necessary in order for the collar not to be allowed to rotate around the container and to make the fastening points and/or the support arrangement in the collar stay in place. It is also possible to omit such fastening parts, in which case the collar is fastened to itself. Without any fastening parts, the movement of the collar with respect to the vessel and the base can be prevented in other manners. Depending on the implementation, it is also possible to allow the collar to move with respect to the vessel and the base.

[0026] An embodiment relates to a method of manu-

facturing a plastic container. The plastic container may be any one of the above-described plastic containers. Such a plastic container comprises a plastic vessel 102 and a plastic base 104. The method comprises forming the vessel 102 and the base 104 by rotational casting. The formed vessel 102 is placed in the base 104, and the vessel 102 placed in the base is joined with the base by means of a collar 106. This provides a firm and light-weight container which is quick to manufacture.

[0027] In an embodiment, the method is used for manufacturing a container in which the vessel 102 resides at least in part inside the base 104. The method comprises forming the vessel 102 and the base 104 by rotational casting. The rotational casting of the vessel and the base may be carried out for instance as described above. The vessel 102 thus formed is placed at least in part inside the base 104. The vessel and the base that are at least in part placed inside one another are joined by means of a collar 106. This provides a container in which the base outlines and supports the vessel on the sides of the vessel.

[0028] The above-described embodiments describe the structure of the container and its parts as regards the base, the collar and the vessel. The steps of the described methods may be modified and/or added for manufacturing a container or parts thereof according to the above-described embodiment.

[0029] It is apparent to a person skilled in the art that as technology advances, the basic idea of the invention may be implemented in many different ways. The invention and its embodiments are thus not restricted to the examples described above but may vary within the scope of the claims.

Claims

1. A container (100) comprising a plastic vessel (102), a plastic base (104), and a collar (106) to join the vessel (102) with the base (104).
2. A container (100) as claimed in claim 1, wherein the collar (106) comprises a support arrangement (112a, 112b) on an upper surface of the vessel (102) for supporting another container to be placed on top of the container (100).
3. A container (100) as claimed in claim 1 or 2, wherein the collar (106) comprises on the upper surface of the vessel (102) at least two spaced apart fastening points (110a, 110b) for fastening lifting means to the fastening points (110a, 110b) for lifting the container (100).
4. A container (100) as claimed in any one of claims 1 to 3, wherein the base (104) comprises fastening parts (114) on oppositely residing sides of the base (104) for fastening the collar (106) to the vessel

(102).

5. A container (100) as claimed in any one of claims 1 to 4, the container (100) comprising a groove (116) in which the collar (106) is mounted.
6. A container (100) as claimed in any one of claims 1 to 5, wherein the base (104) extends upwards at least in part around the sides of the vessel (102).
7. A container (100) as claimed in any one of claims 1 to 6, wherein the vessel (102) is at least in part inside the base (104).
8. A container (100) as claimed in any one of claims 1 to 7, wherein the base (104) outlines and supports the vessel (102) on the sides of the vessel, and the collar (106) joins the vessel (102) with the base (104) in a vertical direction.
9. A container (100) as claimed in any one of claims 1 to 8, wherein the collar (106) runs to the base (104) across the vessel.
10. A method of manufacturing a plastic container (100), the plastic container comprising a plastic vessel (102) and a plastic base (104), the method comprising:
 - forming the vessel (102) and the base (104) by rotational casting;
 - placing the formed vessel (102) in the base (104);
 - joining the vessel (102) placed in the base (104) with the base (104) by means of a collar (106).

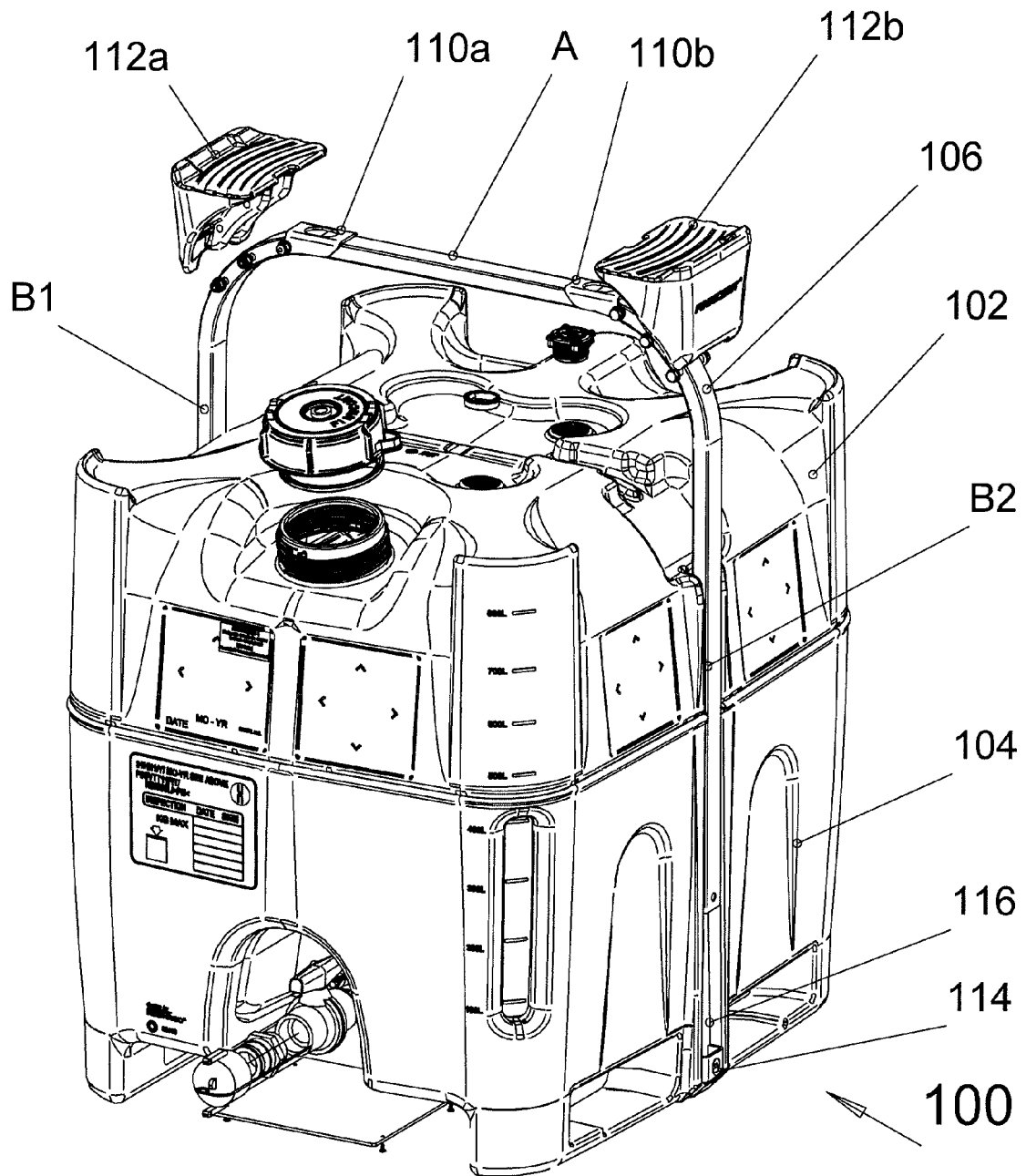


FIG. 1

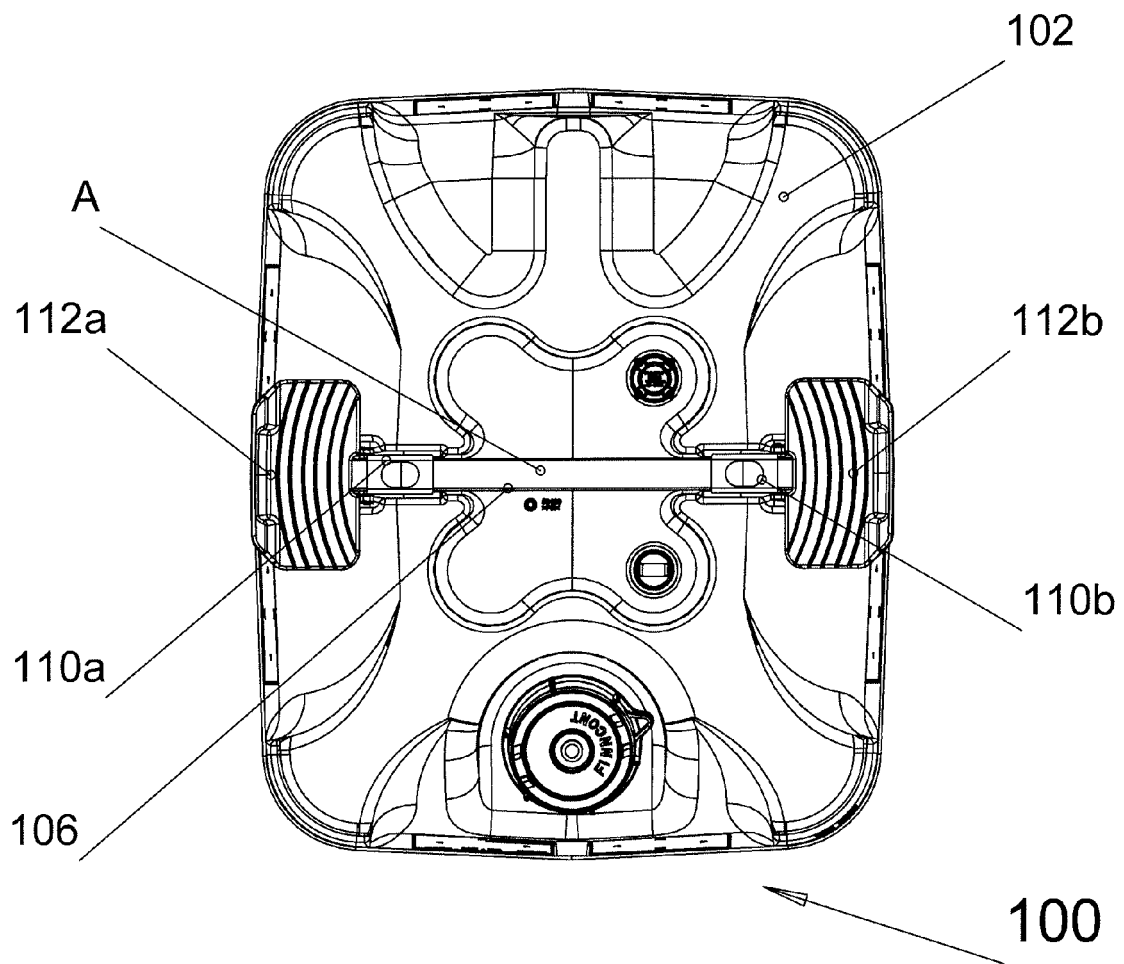


FIG. 2

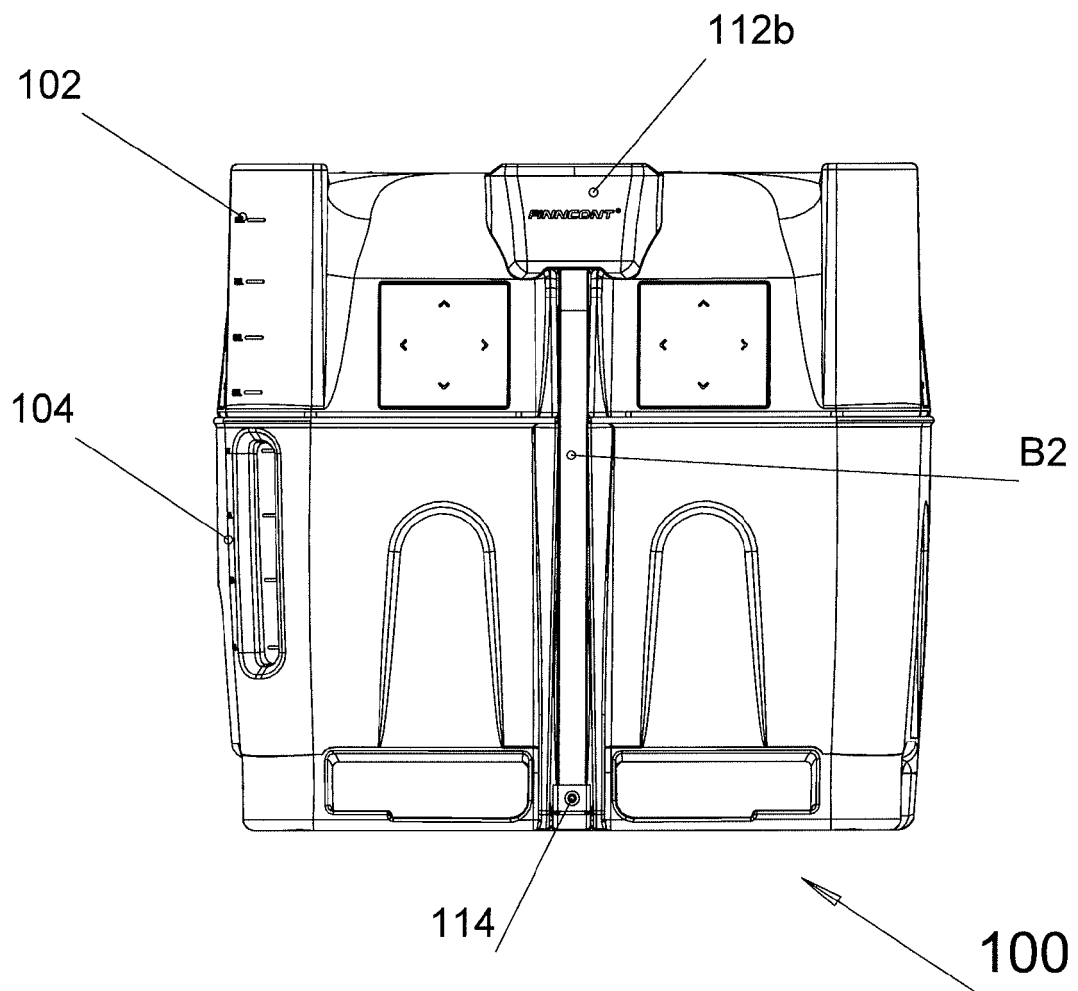


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 15 18 9052

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Place of search Munich		Date of completion of the search 28 January 2016	Examiner Lämmel, Gunnar
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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