P 2/92 PCT-AU

Australia Patents Act 1990

Notice of Entitlement

(to be filed before acceptance) 662329

~~I~~/We Otto-Wilhelm Paßberger and Dr. Klaus Herforth
being authorised by MAUSER-WERKE GMBH
of Schildgesstrasse 71-163, 50321, Bruhl, Germany

the applicant in respect of an application for a patent for an invention entitled "High-capacity drum with lid"

filed under Australian Application No. 16936/92 state the following:-

Part 1 - *Must be completed for all applications.*

☐ The person(s) nominated for the grant of the patent: Mauser-Werke GmbH ~~is/are the actual inventor(s)~~

or

☒ has, for the following reasons, gained entitlement from the actual inventor(s):

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The basic application(s) listed on the request form is/are the first application(s) made in a Convention country ~~in respect~~ of the invention.

Part 3 - *must be completed if the application was made under the PCT and claims priority.*

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The basic application~~(s)~~ listed in the declaration made under Article 8 of the PCT is/~~are~~ the first application~~(s)~~ made in a Convention country in respect of the invention.

Mauser-Werke GmbH

Signed: Paßberger Dr. Herforth Date: July 30, 1993

Status: authorized management

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AUSTRALIA PATENT OFFICE AMB

AU9216936

(12) PATENT ABRIDGMENT (11) Document No. AU-B-16936/92
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 662329

(54) Title
LARGE CAPACITY LIDDED DRUM

International Patent Classification(s)
(51)[5] **B65D 021/02** **B65D 001/16** **B65D 001/18** **B65D 043/06**

(21) Application No. : **16936/92** (22) Application Date : **13.05.92**

(87) PCT Publication Number : **WO92/21576**

(30) Priority Data

(31) Number	(32) Date	(33) Country
9106443	**25.05.91**	**DE GERMANY**

(43) Publication Date : **08.01.93**

(44) Publication Date of Accepted Application : **31.08.95**

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(56) Prior Art Documents
FR 2588528
GB 2098968
EP 424897

(57) Claim

1. A large-volume, blow-moulded lidded barrel of a thermoplastic synthetic material for the storage and transportation of dangerous filling materials which are fluid or solid, having a substantially tapered barrel body which is of uniform barrel wall thickness everywhere and has an encircling, radially-projecting shell flange which is arranged on the barrel outer wall at a distance of approximately 30 to 50 mm from the barrel upper edge of the upper charging opening and serves as a support for the gas-tight and fluid-tight securing of a barrel lid, having an appropriate radially-projecting encircling lid flange, by means of a clamping ring which is U-shaped in cross-section and engages over the shell flange and the lid flange, in the region of the upper barrel third there being provided, on the outer wall of the barrel body, a stacking edge as a support strip for the stacking into one another of a plurality of tapered lidded barrel bodies of this type, characterised in that the stacking edge is in the form of a second, completely encircling, substantially radially projecting shell flange which is, during shaping

.../2

by blow moulding, integrally upset from the material of the barrel wall by means of mould slides within the blow mould, and in the barrel longitudinal direction the tapered barrel wall runs in a linearly rectilinear manner over the entire circumference from the upper first shell flange down to the vicinity of the barrel base with the exception of the region of the stacking edge, the inside wall of the barrel body being constructed to be continuous in a rectilinear smooth manner in the region of the upper shell flange and in the region of the second stacking-edge shell flange, and the barrel body having an encircling solid base-rolling-ring at the bottom in the transition region from the tapered barrel wall to the barrel base.

PC ANNOUNCEMENT OF THE LATER PUBLICATION OF AMENDED CLAIMS (AND, WHERE APPLICABLE, STATEMENT UNDER ARTICLE 19)
INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation 5 :		(11) Internationale Veröffentlichungsnummer: WO 92/21576
B65D 21/02, 1/16, 1/18	A1	(43) Internationales Veröffentlichungsdatum: 10. Dezember 1992 (10.12.92)

(21) Internationales Aktenzeichen: PCT/EP92/01042

(22) Internationales Anmeldedatum: 13. Mai 1992 (13.05.92)

(30) Prioritätsdaten:
G 91 06 443.0 U 25. Mai 1991 (25.05.91) DE

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(81) Bestimmungsstaaten: AT (europäisches Patent), AU, BE (europäisches Patent), BF (OAPI Patent), BG, BJ (OAPI Patent), BR, CA, CF (OAPI Patent), CG (OAPI Patent), CH (europäisches Patent), CI (OAPI Patent), CM (OAPI Patent), DE (europäisches Patent), DK (europäisches Patent), ES (europäisches Patent), FI, FR (europäisches Patent), GA (OAPI Patent), GB (europäisches Patent), GN (OAPI Patent), GR (europäisches Patent), HU, IT (europäisches Patent), JP, KP, KR, LK, LU (europäisches Patent), MC (europäisches Patent), ML (OAPI Patent), MR (OAPI Patent), MW, NL (europäisches Patent), NO, PL, RO, RU, SD, SE (europäisches Patent), SN (OAPI Patent), TD (OAPI Patent), TG (OAPI Patent), US.

Veröffentlicht
Mit inte. ... m Recherchenbericht.
Mit geän... ...nprüchen und Erklärung.

Veröffentlichungsdatum der geänderten Ansprüche und Erklärung: 21. Januar 1993 (21.01.93)

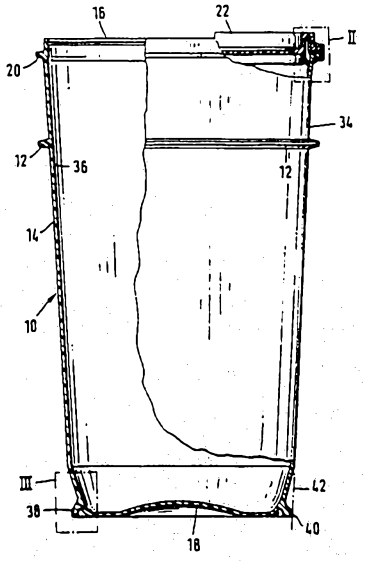
662329

(54) Title: HIGH-CAPACITY DRUM WITH LID

(54) Bezeichnung: GROSSVOLUMIGES DECKELFASS

(57) Abstract

A conical drum with lid made of thermoplastic material is disclosed. In order to avoid stepped variations in diameter or hollow borders that form stack-up edges on the outside of the drum, a second jolted outer flange (12) is formed on the outer wall of the drum (10), in its topmost third (34). Appropriately, the conical wall (14) of the drum extends linearly in a straight line over the whole periphery and in the longitudinal direction of the drum from the top first outer flange (20) down to the proximity of the bottom (18) of the drum. A third jolted outer flange that forms a rolled bottom ring (38) can be provided in the transition area between the wall and the lower bottom of the drum.



(57) Zusammenfassung

Die Erfindung betrifft ein konisches Deckelfaß a... ...hermoplastischem Kunststoff. Zur Vermeidung von stufenförmigen Durchmesserveränderungen oder Hohlborduren als Stapelrand am äußeren Faßkörper ist erfindungsgemäß vorgesehen, daß im Bereich des oberen Faßdrittels (34) auf der Außenwandung des Faßkörpers (10) ein zweiter angestauchter Mantelflansch (12) ausgeformt ist. Zweckmäßigerweise verläuft die konische Faßwandung (14) vom oberen ersten Mantelflansch (20) bis hinunter in den Nahbereich des Faßbodens (18) über den gesamten Umfang und in Faßlängsrichtung linear geradlinig. Im Übergangsbereich von Faßwandung in den Faßunterboden kann ein dritter angestauchter Mantelflansch als Bodenrollring (38) vorgesehen sein.

LARGE-CAPACITY LIDDED DRUM

This invention relates, to a large capacity blow-moulded lidded barrel or drum (wide-necked packing barrel or drum) made of thermoplastic plastic for storing and transporting hazardous liquid or solid contents, having a substantially tapered barrel or drum body which has, on its outer wall in the vicinity of the upper charging opening, a circumferential surface flange for the gas- and liquid-proof fastening of a barrel or drum lid by means of an overlapping tension ring, a stacking rim being provided on the outer wall of the barrel or drum body in the region of the upper third of the barrel or drum to allow a plurality of such conical lidded barrels or drums to be stacked one inside the other.

The invention does not relate to small conical packing drums manufactured using the injection moulding technique, such as, for example, paint buckets or the like.

Conical lidded drums, when empty, may be stacked one inside the other and therefore offer the major advantage that, despite their large dimensions, they are economical in terms of freight space and cost during dispatch and are correspondingly economical to store when empty.

A conical plastic lidded drum of the type described is known, in which the drum body is provided with a discontinuous step-like diameter increase in the region of its upper third, with the drum wall being cylindrical from said diameter increase up to the upper drum opening. By

virtue of the projecting wall step, an outer stacking rim is provided and an upper lidded drum nested into a lower drum may be supported on the upper drum rim of the charging opening of the lower drum, thereby preventing a plurality of nested drums from becoming wedged one inside the other so that they are virtually impossible or require a great deal of effort to separate again. Said drums, in a stable construction with an appropriate wall thickness, have proved successful as reusable packaging. In the case of lightweight drums of reduced wall thickness, however, the stability under load of a stack could become limited or critical when a plurality of full drums are stacked one on top of the other.

Another conical industrial drum is provided in its upper wall region with a plurality of spaced-apart calottes, which are formed so as to project outwards and each have on their outer bottom edge an axial stop face as a stacking edge. As a result, however, there are corresponding pockets or partial bulges in the drum inner wall which are a drawback in the final stages of emptying the drum because residues of adhesive contents may remain in said pockets and make it difficult to clean the drums for re-use.

A plastic rain barrel having an, in particular, conical drum body is also known. This rain barrel of a different generic type is, however, a stationary container and is also not suitable for transporting, in particular,

hazardous liquid or solid contents because the barrel cannot be tightly sealed. Admittedly, the uppermost rim of the charging opening is flanged outwards almost at right angles and forms the supporting surface for a barrel lid which is inserted into the barrel opening and rests on the flanged rim but, in the absence of a sealing facility and a difference in diameter between barrel flange and lid rim, said barrel lid cannot be fixed by means of a tension ring in a liquid-proof manner on the barrel opening. Nor was there in any way provision for this because the lid has a non-closable central inlet opening for the collection of rain water and moreover merely serves, for example, to prevent leaves or other particles from falling into the barrel.

The object of the present invention is to propose a blow-moulded conical lidded drum made of thermoplastic, with which the possibility of nesting empty drums one inside the other and stacking full drums, each tightly closed with a lid and tension ring, one above the other as well as subsequent trouble-free internal cleaning ready for multiple use is fully retained and yet it is possible to reduce the drum wall thickness, with a saving in the plastic raw material used, to achieve a lightweight drum construction.

~~This object is achieved according to the invention in that the stacking rim takes the form of a second, substantially radially projecting surface flange extending~~

In a broad aspect, the present invention provides a large-volume, blow-moulded lidded barrel of a thermoplastic synthetic material for the storage and transportation of dangerous filling materials which are fluid or solid, having a substantially tapered barrel body which is of uniform barrel wall thickness everywhere and has an encircling, radially-projecting shell flange which is arranged on the barrel outer wall at a distance of approximately 30 to 50 mm from the barrel upper edge of the upper charging opening and serves as a support for the gas-tight and fluid-tight securing of a barrel lid, having an appropriate radially-projecting encircling lid flange by means of a clamping ring which is U-shaped in cross-section and engages over the shell flange and the lid flange, in the region of the upper barrel third there being provided, on the outer wall of the barrel body, a stacking edge as a support strip for the stacking into one another of a plurality of tapered lidded barrel bodies of this type, characterised in that the stacking edge is in the form of a second, completely encircling, substantially radially projecting shell flange which is during shaping by blow moulding, integrally upset from the material of the barrel wall by means of mould slides within the blow mould, and in the barrel longitudinal direction the tapered barrel wall runs in a linearly rectilinear manner over the entire circumference from the upper first shell flange down to the vicinity of the barrel base with the exception of the region of the stacking edge, the inside wall of the barrel body being constructed to be continuous in a rectilinear smooth manner in the region of the upper shell flange and in the region of the second stacking-edge shell flange, and the barrel body having an encircling solid base-rolling-ring at the bottom in the transition region from the tapered barrel wall to the barrel base.

By providing, as it were, an additional component in the form of the second radially projecting surface flange on the drum outer wall, the entire drum body remains free of sudden changes in diameter or outwardly-extending bules in the drum wall. To cope with the comparatively low stressing of the second surface flange when a plurality of empty drums are nested one inside the other, it is sufficient if the surface flange is approximately one and a half to two times as thick as the drum wall.

The stacking rim surface flange is integrally upset from the material of the barrel or drum wall in a single working process, directly in the blowing mould during shaping of the hollow body, by means of suitable mould slides. The additional surface flange lends the comparatively thin-walled drum body increased radial rigidity and stacking stability for stacking a plurality of full drums one above the other.

Advantageously, the conical drum wall is designed so as to be linearly straight-lined from the upper first surface flange down to the vicinity of the drum base over

its entire periphery in the drum longitudinal direction; as a result of shaping the drum in this manner, the drum wall continuously tapers uniformly downwards with a high rigidity of the drum wall against axial pressure load or stack loads despite a reduced drum wall thickness of, for example, 5.5 mm compared with a conventional drum wall thickness of around 7.5 mm in a comparable known conical lidded drum.

When empty drums are nested, the drum according to the invention is supported by the lower edge of the second radially projecting surface flange as a stacking rim on the drum upper edge of a drum stacked below. Since, according to a further feature of the invention, the inner wall of the drum body is designed so as to be free of bulges or hollow ring borders, being rectilinearly flat and smooth throughout particularly also in the region of the upper surface flange and the second stacking rim surface flange, reconditioning of the drums according to the invention for re-use is also perfectly simple and straightforward.

Since the main aim of the invention is geared inter alia towards a reduction in the required drum wall thickness, it may be advantageous if the drum body has below, in the transition region from conical drum wall to drum base, a circumferential, stable and solid bottom rolling ring. As a result, in the event of oblique rolling of a full drum in an inclined or tilted drum positioning by hand by a handler, the partial pressure load of the outer

rim of the drum base is distributed over a wider reinforced peripheral region, and denting of the drum base at the relevant point of contact and any associated flexing work in the plastic material is reliably prevented.

According to the invention, the drum body of the new lidded drum may, when viewed in cross-section, present a rectangular or square drum shape with rounded-off corners. This offers considerable advantages in terms of utilizing available space if, for example, the drums are stored or transported tightly packed on pallets or in standard containers.

It is technically feasible to prefabricate the upper first surface flange for fastening the lid, the second stacking rim surface flange or/and the bottom rolling ring each as a separate injection moulded part which is then glued or welded onto the conical drum body. According to a further feature of the invention, it is however provided that the surface annular flanges (including the bottom rolling ring) are all constructed as integral solid parts from the thermoplastic plastic tube or from the drum wall as a result of upsetting, simultaneously with blow moulding, by means of mould slides provided in the blowing mould. Thus, the drum body may be manufactured with three circumferential surface flange rings in a single working process from the same homogeneous material. This is advantageous for the overall stability and fall strength of the drum body.

The invention is explained and described in greater detail hereinafter with reference to embodiments which are illustrated in the drawings. In the drawings:

Fig. 1 shows a conical lidded drum according to the invention in a part-sectional side view,

Fig. 2 shows an enlarged detail from the top right of Fig. 1,

Fig. 3 shows an enlarged detail from the bottom left of Fig. 1,

Fig. 4 shows a side view with a part-sectional view of three empty drums nested one inside the other,

Fig. 5 shows a detail sectional view of the drum wall in the region of the stacking rim surface flange,

Fig. 6 to Fig. 8 show further detail sectional views with modifications according to the invention in the region of the drum wall with stacking rim surface flange,

Fig. 9 shows a detail sectional view of the lower drum wall in the transition region to the drum base and

Fig. 10 shows a plan view of a further plastic lidded drum according to the invention which is rectangular in cross-section.

In Figure 1, the reference numeral 10 denotes the drum body of a large-capacity lidded drum made of thermoplastic (wide-necked packing drum having a capacity of, for example, 150 litres, 160 litres or 200 litres). To allow empty drums to be nested one inside the other for transport purposes, the conical drum wall is designed so as to be

linearly straight from the upper first surface flange 20 down to the vicinity of the drum base 18 over the entire periphery and in drum longitudinal direction, and a second surface flange 12 is disposed as a stacking rim on the outer wall of the drum body 10 in the region of the top third of the drum 34. This guarantees a high axial rigidity. The inner wall 36 of the drum body 10 is designed so as to be rectilinearly smooth throughout, especially also in the region of the upper surface flange 20 and the second stacking rim surface flange 12 as well as in the region of the bottom rolling ring 38. This is advantageous for emptying residues and for internal cleaning of the drums for multiple use.

To increase its radial rigidity, according to an advantageous development the drum body 10 has below, in the transition region from conical drum wall 14 to the drum base 18, a circumferential solid bottom rolling ring 38, as may be seen in the enlarged view of Figure 3. The slightly conical drum wall 24 has, in the lower region towards the bottom rolling ring 38, a greater degree of taper than in the upper conical drum body 10, such that the bottom rolling ring 38 has a reduced diameter and the radial outer edge 40 of the bottom rolling ring 38 lies within the extension line 42 of the upper slightly conical drum wall 14 (Fig. 1). The drum base 18 is cambered slightly inwards or concave in the middle; it could however alternatively be smooth and flat, as shown in Fig. 4.

As is shown more clearly in Figure 2, the drum lid 22 has an inner lid ring engaging into the drum charging opening 16 and an outer rim which overlaps the drum upper rim 24 and has an outer flange 26 extending radially therefrom. Disposed in the annular recess left free between inner lid ring and lid outer rim is a sealing ring 28 which, when the lid 22 is clamped on by means of a tension ring 30, seals the drum opening 16 against the drum upper edge 32 of the drum upper rim 24 engaging into the annular recess.

Advantageously, the tension ring 30 is equal-sided and may be fitted in any manner, without having to observe a particular orientation, and tightened over the surface flange 20 of the drum body 10 and the outer flange 26 of the drum lid 22.

Figure 4 shows three empty drums nested one inside the other. From this it is evident that an upper nested drum is supported by the underside of its stacking rim surface flange 12 on the drum upper edge 32 of the upper drum rim 24 of the drum 10 nested below and an air space is left between the inner wall of the lower outer drum and the outer wall of the inner drum nested above, so that the drums are reliably prevented from becoming wedged and sucked into one another with vacuum or partial vacuum formation, which makes it very difficult to remove drums from the stack.

Fig. 4 shows a further variation of the stacking rim

outer flange according to the invention. Here, the stacking rim surface flange 12 is also continuous but, in order to provide an engagement means directly on the stacking rim surface flange 12 for grasping and lifting out the top drum of a plurality of nested empty drums, the surface flange 12 is offset slightly upwards in segments at, at least two, preferably four diametrically opposed points. The flange could in principle alternatively extend in a uniformly undulating manner. Thus, engagement recesses 46 are formed in each of the raised segments (wave crests), while the lower segments 48 (wave troughs) are, as before, the stacking rim support surface associated with the drum body nested below. The length of an engagement recess 46 in a peripheral direction is in each case between 80 and 120 mm.

Figure 5 shows an enlarged detail of the drum wall 14 in the region of the second surface flange 12 or stacking rim. Here, the drum wall in the upper third of the drum body above the surface flange 12 is not conical but perfectly cylindrical; below the surface flange the drum wall tapers rectilinearly. The radially projecting surface flange 12 is solid and is virtually triangular in cross-section with an oblique upper surface 62 ascending towards the drum wall and an oblique lower surface 64 (= stack support surface) descending towards the drum wall. Externally, the flange rim is approximately the same thickness as the drum wall and on the inside the flange rim

is approximately twice as thick as the drum wall. Diagrammatically illustrated by the dashed lines is the drum upper rim 24 of a drum stacked below, on which the surface flange 12 of the drum stacked above is supported by its lower surface 64.

In the variant of the conical lidded drum shown in Figure 6, the drum body in the region of its upper third above the surface flange 12 is cambered slightly outwards (curved in a convex manner).

In the further drum variant shown in Figure 7, the drum wall extends continuously rectilinearly from top to bottom. Here, in an advantageous development, the stacking rim surface flange is formed as a handling ring 54. The handling ring 54 (carrying and supporting ring) is substantially L-shaped in cross-section, having a vertical outer limb 50 and a horizontal inner limb 52; the horizontal limb 52 is directly connected to the drum wall 14. To allow the grab claws of a drum grab to engage, the vertical limb 50 has on its inside a vertical locating face 58 and the horizontal limb 52 has below a horizontal locating face 56 which also serves as a stack support surface when empty drums are nested one inside the other.

Finally, Figure 8 shows a further possible drum variation. Here, the drum wall above the handling ring 54 or surface flange 12 tapers rectilinearly and below the surface flange 12 is cambered slightly outwards (curved in a convex manner) and likewise tapers. The handling ring 54

shown here is substantially rectangular in cross-section and likewise has a lower horizontal locating face 56 and an inner vertical locating face 58 for engagement of the grab claws of the drum grab. Here, the handling ring 54 is however connected, not directly, but via a, to some extent elastic, connection web 60 to the drum wall 14, with the underside of the connection web 60 serving as the stacking rim for the drum upper rim 24 of a second drum stacked below.

The handling rings shown in Figs. 7 and 8 are advantageously provided at at least one point with a bore to allow rain water to run off. Another possibility for a reinforced design of the rim of the drum base is shown in Figure 9. By purposeful nozzle control, a build-up of material may be arranged in said drum region and, as a result of the special structural design of the blow-moulded drum body, improved radial rigidity in the event of oblique rolling of a full drum may be achieved. Here, the outermost edge of the drum base 18 or the lowermost region of the conical drum wall has a narrow bevelled rolling rim 66. The drum base is cambered inwards (curved in a concave manner) or slightly raised in the middle so that only a comparatively narrow flat peripheral surface is left adjoining the rolling rim 66 as a standing surface 68 for the lidded drum.

Finally, Figure 10 shows a plan view of a further embodiment of the drum according to the invention; here,

the drum body, when viewed in cross-section, presents a rectangular drum shape with rounded-off corners 44. The lidded drum could, of course, alternatively present a square basic shape.

The features described and illustrated may be varied or combined in any way within the scope of the invention.

From all this it is clear that the features according to the invention of the new conical lidded drum made of thermoplastic make it possible to reduce the drum wall thickness (lightweight construction) while retaining stacking stability when full drums are stacked one above the other. Thus, the drum body of a lidded drum according to the invention made of HDPE and having a capacity of 150 litres weighs only about 5.3 kg, while a comparable known conical lidded drum requires an empty drum weight of around 6.9 kg.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A large-volume, blow-moulded lidded barrel of a thermoplastic synthetic material for the storage and transportation of dangerous filling materials which are fluid or solid, having a substantially tapered barrel body which is of uniform barrel wall thickness everywhere and has an encircling, radially-projecting shell flange which is arranged on the barrel outer wall at a distance of approximately 30 to 50 mm from the barrel upper edge of the upper charging opening and serves as a support for the gas-tight and fluid-tight securing of a barrel lid, having an appropriate radially-projecting encircling lid flange, by means of a clamping ring which is U-shaped in cross-section and engages over the shell flange and the lid flange, in the region of the upper barrel third there being provided, on the outer wall of the barrel body, a stacking edge as a support strip for the stacking into one another of a plurality of tapered lidded barrel bodies of this type, characterised in that the stacking edge is in the form of a second, completely encircling, substantially radially projecting shell flange which is, during shaping by blow moulding, integrally upset from the material of the barrel wall by means of mould slides within the blow mould, and in the barrel longitudinal direction the tapered barrel wall runs in a linearly rectilinear manner over the entire circumference from the upper first shell flange down to the vicinity of the barrel base with the exception of the region of the stacking edge, the inside wall of the barrel body being constructed to be continuous in a rectilinear smooth manner in the region of the upper shell flange and in the region of the second stacking-edge shell flange, and the barrel body having an encircling solid base-rolling-ring at the bottom in the transition region from the tapered barrel wall to the barrel base.

2. A lidded barrel in accordance with claim 1, characterised in that the barrel wall of the sightly

tapered barrel body is in addition dished slightly outwards above and/or below the second stacking-edge shell flange.

3. A lidded barrel in accordance with claim 1 or 2, characterised in that the slightly tapered barrel wall in the lower region towards the base rolling ring is more tapered than the upper tapered barrel body, in such a manner that the base rolling ring has a reduced circle diameter and the radial outer edge of the base rolling ring lies within the projection line of the upper slightly tapered barrel wall.

4. A lidded barrel in accordance with claim 1 or 2, characterised in that although the stacking-edge shell flange is continuous, segments thereof at at least two diametrically opposite sites are however displaced upwards slightly, and in each case gripping recesses for manual gripping are provided in the upwards-displaced segments.

5. A lidded barrel in accordance with claim 1, 2, 3, or 4, characterised in that the barrel body has, when viewed in cross-section, a substantially rectangular barrel form with rounded corners.

6. A lidded barrel in accordance with any one of the preceding claims 1 to 5, characterised in that the upper first shell flange for lid securing, the second stacking-edge shell flange and the base rolling ring are integrally constructed from the barrel wall through upsetting by means of mould slides within the blow mould.

7. A lidded barrel in accordance with any one of the preceding claims 1 to 6, characterised in that the stacking-edge shell flange has a substantially L-shaped cross-section with a vertical outer leg, the horizontal leg being directly connected to the barrel wall.

8. A lidded barrel in accordance with any one of the preceding claims 1 to 7, characterised in that the stacking-edge shell flange is, when viewed in cross-section, constructed as a substantially rectangular

handling ring with a lower horizontal contact surface and an inner vertical contact surface for the engagement of the grab claws of a barrel gripper, the handling ring being connected to the barrel wall via a downwards-inclined connecting crosspiece and this connecting crosspiece serving as a stacking edge.

9. A lidded barrel substantially as hereinbefore described with reference to the accompanying drawings.

DATED this 1st day of June 1995

MAUSER-WERKE GMBH
Patent Attorneys for the
Applicant:

F.B. RICE & CO.

16936/92

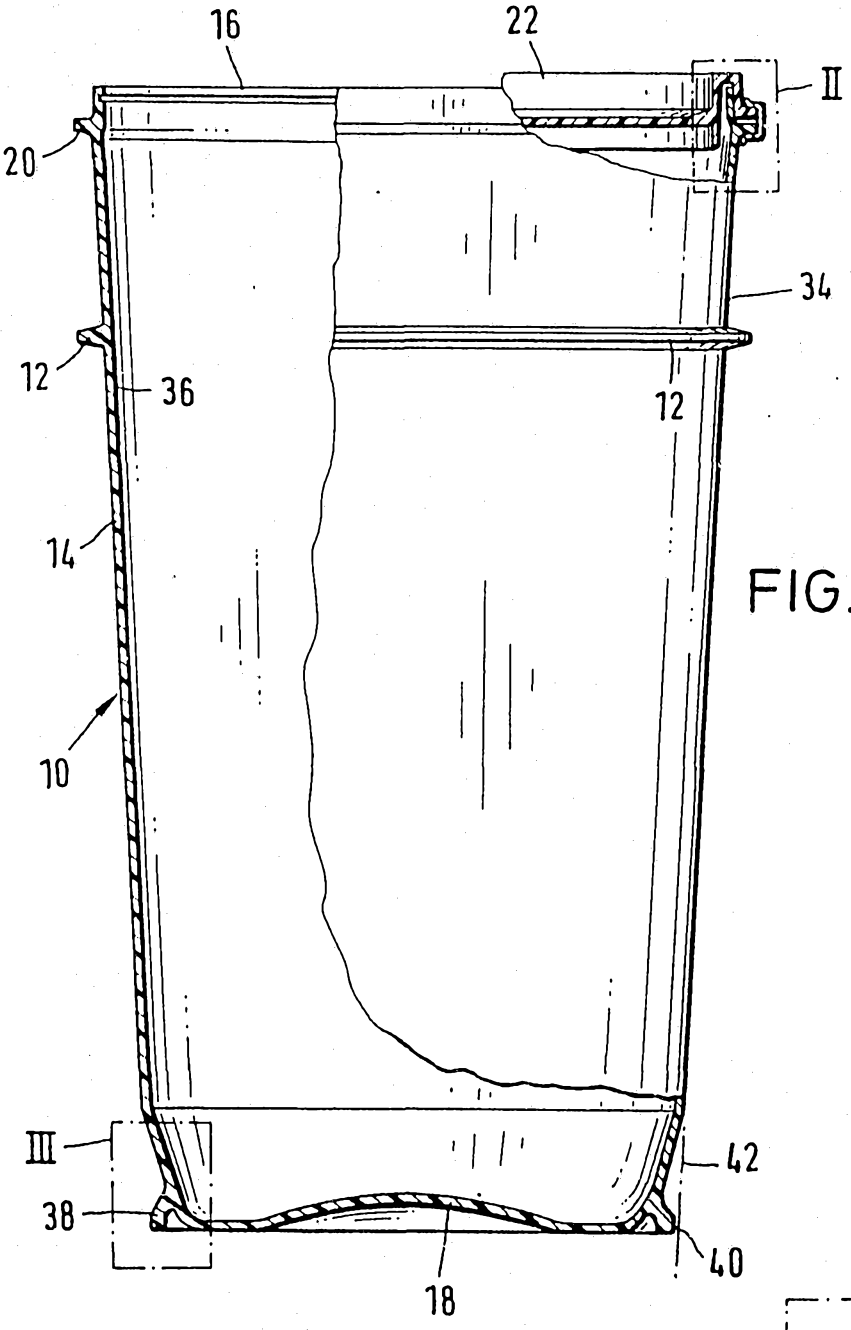


FIG.1

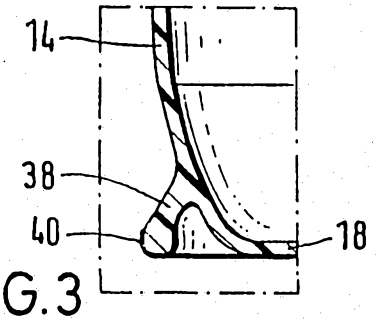


FIG.3

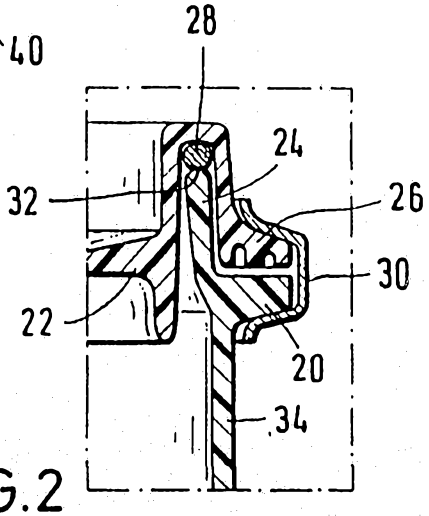


FIG.2

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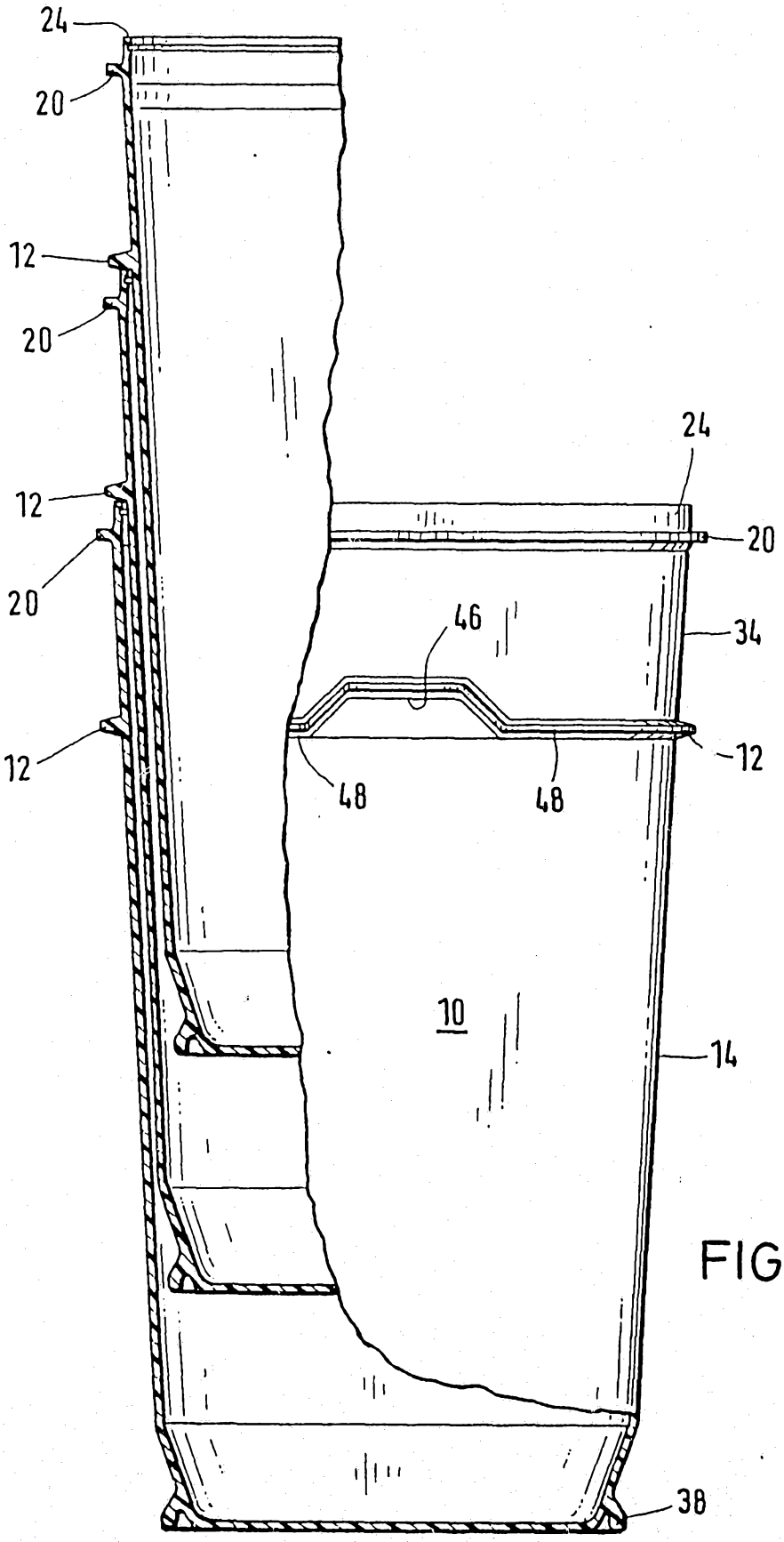

FIG.4

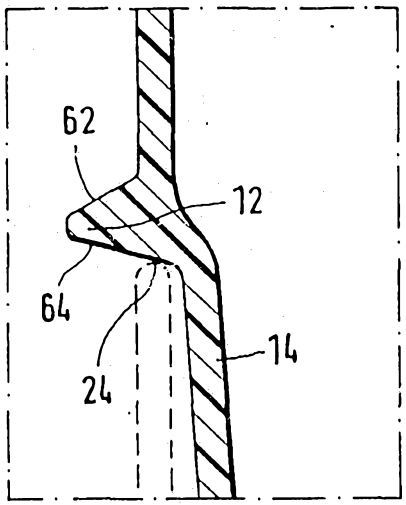

FIG.5

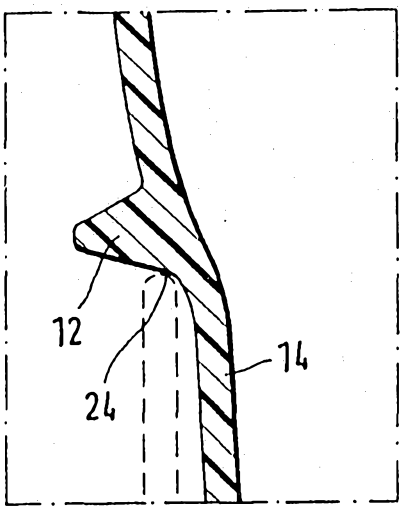

FIG.6

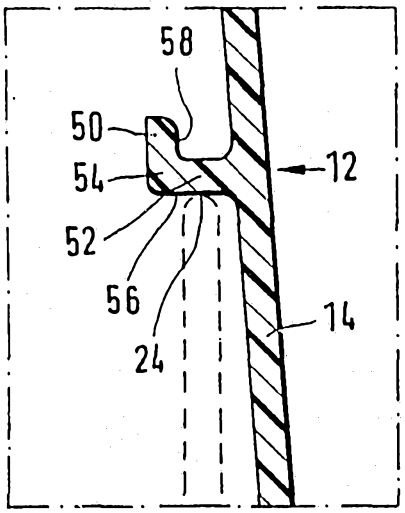

FIG.7

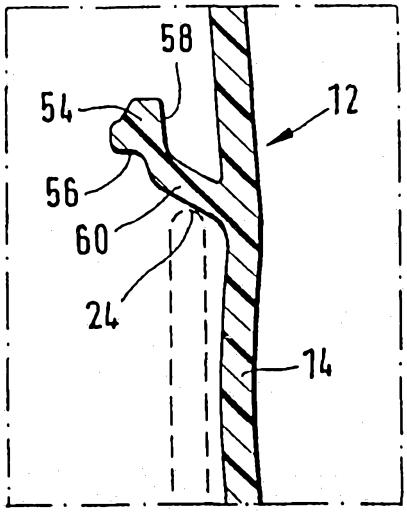

FIG.8

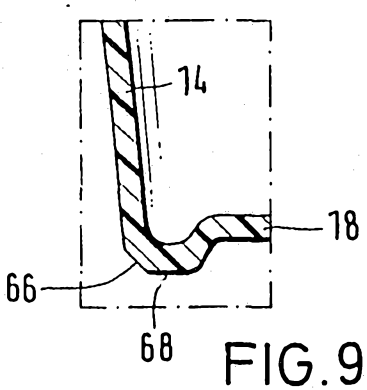

FIG.9

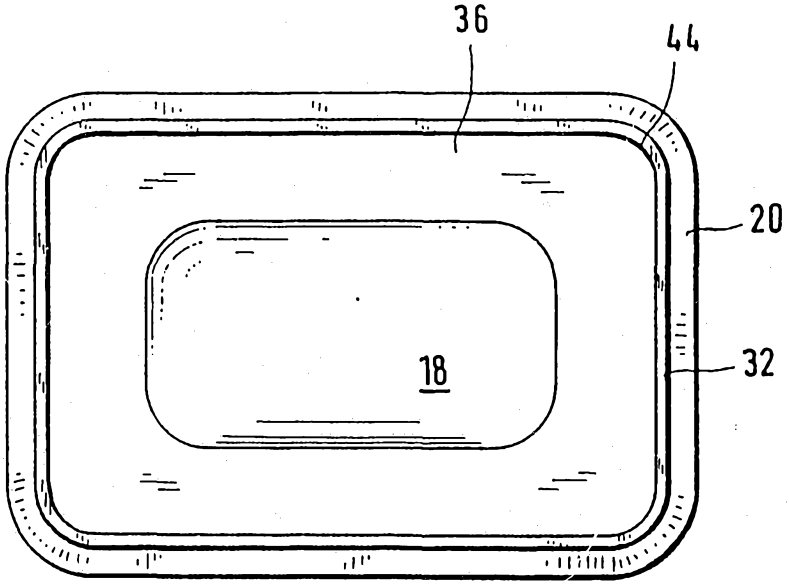

FIG.10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 92/01042

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.[5] B 65 D 21/02 ; B 65 D 1/16; B 65 D 1/18

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)

Int.Cl.[5] B 65 D

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	FR, A, 2 588 528 (LABONORD S.A.R.L.) 17 April 1987 see page 3, line 27 - page 5, line 21; figure 1 --	1,3 2,4-9
Y	WO, A, 9 103 402 (THE DOW CHEMICAL COMPANY) 21 March 1991 see page 7, line 3 - page 8, line 12 see figure 7 --	2
Y	DE, U, 9 011 586 (MAUSER-WERKE GMBH) 25 October 1990 see page 6,line 24 -line 32 see figure 2B --	4,5
	-/--	

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 September 1992 (11.09.92)	13 October 1992 (13.10.92)
Name and mailing address of the ISA/	**Authorized officer**
European Patent Office Facsimile No.	Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 92/01042

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP, A, 0 025 510 (FRITZ SHÄFER GMBH FABRIKEN FÜR LAGER- UND BETRIEBSEINRICHTUNGEN) 25 March 1981 see page 10, line 30 - page 11, line 6 see figures 1,3,4 --	6,7
Y	DE U, 9 006 150 (MAUSER-WERKE GMBH) 9 August 1990 see page 4, line 33 -line 34 --	8
Y	DE, A, 2 600 829 (MAUSER KG) 4 August 1977	9
A	see page 4, line 23 -line 34 see figures 1,2 ----------	8

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. EP 9201042 SA 59991

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 14/09/92

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
FR-A-2588528	17-04-87	None		
WO-A-9103402	21-03-91	US-A-	4928839	29-05-90
		AU-A-	5723990	08-04-91
		EP-A-	0490899	24-06-92
DE-U-9011586	25-10-90	EP-A-	0471918	26-02-92
EP-A-0025510	25-03-81	DE-A-	2937666	02-04-81
		AT-T-	3523	15-06-83
DE-U-9006150	09-08-90	CA-A-	2041383	01-12-91
		EP-A-	0459124	04-12-91
DE-A-2600829	04-08-77	None		

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen PCT/EP 92/01042

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben)[6]

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

Int.Kl. 5 B65D21/02; B65D1/16; B65D1/18

II. RECHERCHIERTE SACHGEBIETE

Recherchierter Mindestprüfstoff [7]

Klassifikationssytem	Klassifikationssymbole
Int.Kl. 5	B65D

Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen [8]

III. EINSCHLAGIGE VEROFFENTLICHUNGEN [9]

Art.°	Kennzeichnung der Veröffentlichung[11], soweit erforderlich unter Angabe der maßgeblichen Teile[12]	Betr. Anspruch Nr.[13]
X Y	FR,A,2 588 528 (LABONORD S.A.R.L.) 17. April 1987 siehe Seite 3, Zeile 27 - Seite 5, Zeile 21; Abbildung 1	1,3 2,4-9
Y	WO,A,9 103 402 (THE DOW CHEMICAL COMPANY) 21. März 1991 siehe Seite 7, Zeile 3 - Seite 8, Zeile 12 siehe Abbildung 7	2
Y	DE,U,9 011 586 (MAUSER-WERKE GMBH) 25. Oktober 1990 siehe Seite 6, Zeile 24 - Zeile 32 siehe Abbildung 2B	4,5

-/--

° Besondere Kategorien von angegebenen Veröffentlichungen [10]:

"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist

"E" älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist

"L" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt)

"O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht

"P" Veröffentlichung, die vor dem internationalen Anmeldedatum, aber nach dem beanspruchten Prioritätsdatum veröffentlicht worden ist

"T" Spätere Veröffentlichung, die nach dem internationalen Anmeldedatum oder dem Prioritätsdatum veröffentlicht worden ist und mit der Anmeldung nicht kollidiert, sondern nur zum Verständnis des der Erfindung zugrundeliegenden Prinzips oder der ihr zugrundeliegenden Theorie angegeben ist

"X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden

"Y" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als auf erfinderischer Tätigkeit beruhend betrachtet werden, wenn die Veröffentlichung mit einer oder mehreren anderen Veröffentlichungen dieser Kategorie in Verbindung gebracht wird und diese Verbindung für einen Fachmann naheliegend ist

"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist

IV. BESCHEINIGUNG

Datum des Abschlusses der internationalen Recherche	Absendedatum des internationalen Recherchenberichts
11.SEPTEMBER 1992	13. 10. 92
Internationale Recherchenbehörde	**Unterschrift des bevollmächtigten Bediensteten**
EUROPAISCHES PATENTAMT	SMOLDERS R.C.H.

III. EINSCHLAGIGE VEROFFENTLICHUNGEN (Fortsetzung von Blatt 2)

Art °	Kennzeichnung der Veröffentlichung, soweit erforderlich unter Angabe der maßgeblichen Teile	Betr. Anspruch Nr.
Y	EP,A,0 025 510 (FRITZ SCHÄFER GMBH FABRIKEN FÜR LAGER- UND BETRIEBSEINRICHTUNGEN) 25. März 1981 siehe Seite 10, Zeile 30 - Seite 11, Zeile 6 siehe Abbildungen 1,3,4 ---	6,7
Y	DE,U,9 006 150 (MAUSER-WERKE GMBH) 9. August 1990 siehe Seite 4, Zeile 33 - Zeile 34 ---	8
Y	DE,A,2 600 829 (MAUSER KG) 4. August 1977	9
A	siehe Seite 4, Zeile 23 - Zeile 34 siehe Abbildungen 1,2 -----	8

ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR.

EP 9201042
SA 59991

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben.
Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am 14/09/92
Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie		Datum der Veröffentlichung
FR-A-2588528	17-04-87	Keine		
WO-A-9103402	21-03-91	US-A-	4928839	29-05-90
		AU-A-	5723990	08-04-91
		EP-A-	0490899	24-06-92
DE-U-9011586	25-10-90	EP-A-	0471918	26-02-92
EP-A-0025510	25-03-81	DE-A-	2937666	02-04-81
		AT-T-	3523	15-06-83
DE-U-9006150	09-08-90	CA-A-	2041383	01-12-91
		EP-A-	0459124	04-12-91
DE-A-2600829	04-08-77	Keine		

EPO FORM P0473

Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82