



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/US93/08720 (22) International Filing Date: 15 September 1993 (15.09.93) (30) Priority data: 956,116 5 October 1992 (05.10.92) US (71) Applicant: RANPAK CORPORATION [US/US]; 8023 Crile Road, Concord Township, OH 44077-9702 (US). (72) Inventor: LENCOSKI, Michael, J. ; 11626 Taylor Wells Road, Claridon Township, OH 44024 (US). (74) Agents: O'HEARN, Timothy, J. et al.; Jones, Day, Reavis &amp; Pogue, North Point, 901 Lakeside Avenue, Cleveland, OH 44114 (US).</p>		<p>(81) Designated States: AU, CA, FI, HU, JP, KR, NO, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i></p>
<p>(54) Title: PAPER CUSHIONING PRODUCT</p>		
<p>(57) Abstract</p> <p>A thimble-shaped cushioning product (10) is provided which includes a relatively flat top wall (12) and a tubular wall (14) extending therefrom. In the preferred embodiment, the top wall (12) is circular and approximately 1/2 inch to 1 inch in diameter. Additionally, the tubular (12) is approximately 1/2 inch to 1 inch in length and has a distal edge (16) which follows a jagged path. The cushioning product (10) is preferably made of paper or, more preferably, thirty-pound kraft paper and die-formed from a polygonal or, more preferably, a substantially square, piece of a sheet-like material.</p>		

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## PAPER CUSHIONING PRODUCT

### FIELD OF THE INVENTION

This invention relates generally as  
5 indicated to a paper cushioning product and more  
particularly to a paper cushioning product which has  
the same flowability features as conventional  
styrofoam peanuts and which may be produced by a  
relatively simple die-forming process.

10

### BACKGROUND OF THE INVENTION

In the process of shipping an article from  
one location to another, the article is typically  
placed in a container along with a protective  
15 packaging material to fill any voids and/or to  
cushion the article during the shipping process.  
One common protective packaging material is  
comprised of a plurality of plastic foam, peanut-  
shaped, products which are commonly known as  
20 "styrofoam peanuts." These styrofoam peanuts are of  
such a "flowability" or "pourability" that they may  
be easily poured from a dispenser into a container  
and substantially surround an article positioned  
within the container.

25 While styrofoam peanuts have been widely  
accepted in the packaging industry, they are not  
without disadvantages, the most serious of which is  
their effect on our environment. Quite simply,  
styrofoam peanuts are not biodegradable and thus  
30 they cannot avoid further multiplying our planet's  
already critical waste disposal problems. The non-  
biodegradability of these packaging materials has  
become increasingly important in light of many  
industries adopting more progressive policies in  
35 terms of environmental responsibility.

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This and other disadvantages of styrofoam peanuts has made paper protective packaging material a very popular alternative. Paper is biodegradable, recyclable and renewable; making it an environmentally responsible choice for conscientious companies. In the past, attempts have been made to develop paper cushioning products which have the same flowability features as styrofoam peanuts. For example, U.S. Patent No. 4,997,091 to McCrea discloses pellet-shaped cushioning products which are produced by extruding paper pulp and which probably have the same flowability features as styrofoam peanuts. However, the McCrea process appears to include complicated pulping and extruding steps which would not be necessary in, for instance, a simple die-forming process performed on kraft paper.

Applicants therefore believe that a need remains for a paper cushioning product which has the same flowability features as conventional styrofoam peanuts and which may be made from a relatively simple die-forming process.

#### SUMMARY OF THE INVENTION

The present invention provides a paper cushioning product which has the same flowability features as conventional styrofoam peanuts and which may be made from a relatively simple process. Thus, the cushioning products of the present invention are of such a "flowability" or "pourability" that they may be easily poured from a dispenser while at the same time being biodegradable and recyclable. Additionally, complicated pulping and extruding steps are not necessary to create these environmentally responsible cushioning products.

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More particularly, the present invention provides a cushioning product comprising a relatively flat top wall and a tubular wall extending therefrom. In the preferred embodiment, 5 the top wall is circular and approximately  $\frac{1}{2}$  inch to 1 inch in diameter. Additionally, the tubular wall is approximately  $\frac{1}{2}$  inch to 1 inch in length and has a distal edge which follows a jagged path. The cushioning product is preferably made of paper or, 10 more preferably, thirty-pound kraft paper. Additionally, the product has a geometry consistent with it being formed from a polygonal or, more preferably, a substantially square, piece of a sheet-like material.

15 The present invention also provides a method making a cushioning product which generally includes the steps of providing a piece of a sheet-like material; and forming the piece into a thimble shape. More particularly, the method includes the 20 steps of providing a die and a complimentary punch; positioning the piece of paper over the die; and driving the punch through the die to form the piece of sheet-like material into the desired shape of the cushioning product. The piece of the sheet-like 25 material preferably comprises a polygonal piece of the paper. More preferably, the piece comprises a substantially square piece of thirty-pound kraft which is approximately  $1\frac{1}{2}$  to 2 inches in length/width.

30 A plurality of the cushioning products may be incorporated into a package which additionally includes a container and an article positioned within the container. The cushioning products may be easily poured from a dispenser into the container 35 and will substantially surround the article

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positioned within the container. In this manner,  
the cushioning products will function as a  
protective packaging material which fills any voids  
and/or which cushions the article during a shipping  
5 process.

These and other features of the invention  
are fully described and particularly pointed out in  
the claims. The following descriptive annexed  
drawings set forth in detail one illustrative  
10 embodiment. However this embodiment is indicative  
of but one of the various ways in which the  
principles of the invention may be employed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

15 In the annexed drawings:

Figure 1 is a perspective view of a  
cushioning product according to the present  
invention;

Figure 2 is a schematic illustration of a  
20 method of making a cushioning product according to  
the present invention; and

Figure 3 is a perspective view of a package  
incorporating a cushioning product according to the  
present invention.

25

#### DETAILED DESCRIPTION

Referring now to the drawings in detail,  
and initially to Figure 1, a cushioning product  
according to the present invention is shown  
30 generally at 10. As is explained in more detail  
below the product 10 has the same flowability  
features as conventional styrofoam peanuts and may  
be made from a relatively simple die-forming  
process.

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The cushioning product 10 is generally thimble-shaped. "Thimble-shaped" in this context corresponds to a generally cup-shaped geometry which is roughly sized to be inserted over a person's  
5 finger tip. To this end, the cushioning product 10 comprises a relatively flat top wall 12 and a tubular wall 14 extending therefrom. In the preferred embodiment, the top wall 12 is circular and approximately  $\frac{1}{2}$  inch to 1 inch in diameter.  
10 Additionally, the tubular wall is approximately  $\frac{1}{2}$  inch to 1 inch in length and has a distal edge 16 which follows a jagged path.

Referring now additionally to Figure 2, a method of making a cushioning product according to  
15 the present invention is schematically shown. This method generally includes the steps of providing a piece 20 of a sheet-like material; and forming the piece 20 into a thimble shape. More particularly, the method includes the steps of providing the piece  
20 20 of the sheet-like material; providing a die 22 and a complimentary punch 24; positioning the piece of paper 20 over the die 22; and driving the punch through the die 22 to form the piece of sheet-like material into the desired shape of the cushioning  
25 product 10. Thereafter, the punch 24 is retracted from the die 22 with the formed sheet-like material attached thereto; and the formed sheet-like material is stripped from the retracted punch for use as a cushioning product.

30 The piece 20 of the sheet-like material preferably comprises a polygonal piece of the paper. More preferably, the piece 20 comprises a substantially square piece of thirty-pound kraft which is approximately  $1\frac{1}{2}$  to 2 inches in  
35 length/width. The piece 20 is preferably formed by

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cutting one or more layers of the sheet-like material into a plurality of essentially identical pieces. If square pieces are used to form the cushioning product 10, little or no waste is created during this cutting process. In any event, the cushioning product 10 is preferably made of paper or, more preferably, thirty-pound kraft paper. Additionally, the product 10 has a geometry consistent with it being die-formed from a polygonal or, more preferably, a substantially square, piece of a sheet-like material.

The sheet-like material may be soaked or wet in a starch solution or another suitable stiffening solution prior to the cutting process. Alternatively, the plurality of pieces may be soaked or wet with such a solution prior to the forming process. In either case, this soaking would result in the product 10 having an increased "stiffness" which may be desirable for certain applications.

The die 22 is preferably a circular die having an approximately  $\frac{1}{2}$  inch to 1 inch diameter and the punch 24 is preferably a cylindrical punch with a rounded driving end 28. The die 22 preferably has a highly polished surface and the punch 24 preferably has a textured surface. In this manner, the piece 20 of sheet-like material will slip freely through the die 22 and it will not migrate up the punch 24 during the forming process. If the piece 20 is the preferred square piece of thirty-pound kraft paper, the distal edges of the formed piece will expand slightly once the piece is driven all the way through the die. In this manner, the formed piece may be easily stripped off the

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punch 24 when it is retracted. In the preferred embodiment, the punch is driven approximately  $\frac{1}{2}$  inch to 1 inch through the die.

Referring now additionally to Figure 3, a plurality of the cushioning products 10 are shown incorporated into a package 30. The package 30 additionally includes a container 32 and an article 34 positioned within the container 32. The cushioning products 10 may be easily poured from a dispenser 36 into the container and will substantially surround the article 34 positioned within the container 32. In this manner, the cushioning products 10 will function as a protective packaging material which fills any voids and/or which cushions the article during a shipping process.

One may now appreciate that the present invention provides a paper cushioning product which has the same flowability features as conventional styrofoam peanuts and which may be made from a relatively simple die-forming process. Although the invention has been shown and described with respect to a certain preferred embodiment, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon the reading what is claimed is:

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What is claimed is:

1. A cushioning product comprising a relatively flat top wall and a tubular wall extending therefrom;  
said tubular wall having a distal edge  
5 which follows a jagged path;  
said product having a geometry consistent with it being die-formed from a polygonal piece of a sheet-like material; and  
said top wall being approximately  $\frac{1}{2}$  inch to  
10 1 inch in diameter and said tubular wall being approximately  $\frac{1}{2}$  inch to 1 inch in length.
2. A cushioning product as set forth in claim 1 wherein said product is thimble-shaped.  
15
3. A cushioning product as set forth in claim 2 wherein said top wall is circular.
4. A cushioning product as set forth in  
20 claim 1 wherein said product has a geometry consistent with it being die-formed from a substantially square piece of a sheet-like material.
5. A cushioning product as set forth in  
25 claim 4 wherein said product has a geometry consistent with it being die-formed from a square piece of a sheet-like material which is approximately  $1\frac{1}{2}$  to 2 inches in length/width.
- 30 6. A cushioning product as set forth in any of claims 1-5 wherein said product is made of paper.

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7. A cushioning product as set forth in claim 6 wherein said product is made of thirty-pound kraft paper.

5 8. A cushioning product as set forth in any of claims 1-5 wherein said product is biodegradable and recyclable.

9. A thimble-shaped cushioning product  
10 consisting essentially of a relatively flat top wall and a tubular wall extending therefrom, said product being made of thirty-pound kraft paper and having a geometry consistent with it being die-formed from a substantially square piece of said paper.

15

10. A package comprising a container, an article positioned within said container, and a plurality of cushioning products also positioned within said container and substantially surrounding  
20 said article; each of said cushioning products comprising a relatively flat top wall and a tubular wall extending therefrom, each of said cushioning products having a geometry consistent with it being die-formed from a polygonal piece of a sheet-like  
25 material.

11. A package as set forth in claim 10 wherein each of said cushioning products is thimble-shaped.

30

12. A package as set forth in claim 10 wherein each of said tubular walls has a distal edge which follows a jagged path.

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13. A package as set forth in claim 12  
wherein each of said top walls is circular.

14. A package as set forth in claim 13  
5 wherein each of said top walls is approximately  $\frac{1}{2}$   
inch to 1 inch in diameter and each of said tubular  
walls is approximately  $\frac{1}{2}$  inch to 1 inch in length.

15. A package as set forth in claim 10  
10 wherein each of said products has a geometry  
consistent with it being die-formed from a  
substantially square piece of a sheet-like material.

16. A package as set forth in claim 10  
15 wherein each of said products has a geometry  
consistent with it being die-formed from a  
substantially square piece of a sheet-like material  
which is approximately  $1\frac{1}{2}$  to 2 inches in  
length/width.

20

17. A package as set forth in any of  
claims 10-16 wherein each of said products is  
biodegradable and recyclable.

18. A package as set forth in any of  
25 claims 10-16 wherein each of said products is made  
of paper.

19. A package is set forth in claim 18  
30 wherein each of said products is made of thirty-  
pound kraft paper.

20. A package comprising a container, an  
article positioned within said container, and a  
35 plurality of cushioning products also positioned

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within said container and substantially surrounding  
said article, each of said cushioning products  
comprising a relatively flat top wall and a tubular  
wall extending therefrom, each of said products  
5 being made of thirty-pound kraft paper and having a  
geometry consistent with it being die-formed from a  
substantially square piece of said paper.

21. A thimble-shaped cushioning product  
10 comprising a relatively flat top wall and a tubular  
wall extending therefrom, said product being  
biodegradable and recyclable, and having a geometry  
consistent with it being die-formed from a  
substantially square piece of sheet-like material.

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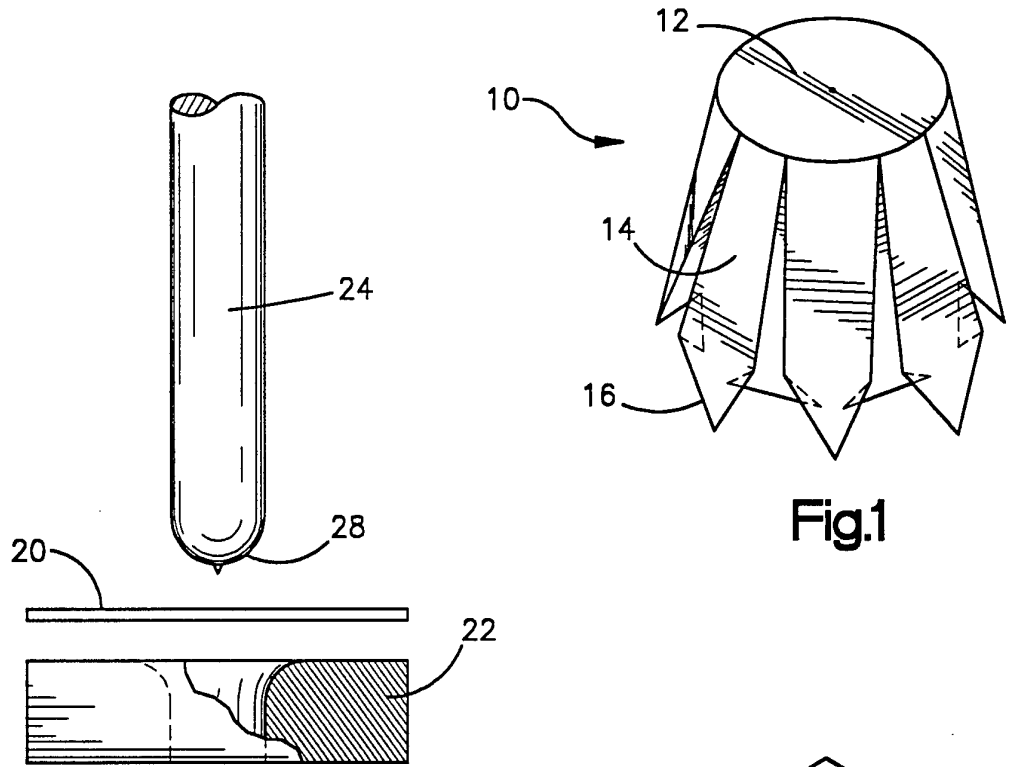


Fig.1

Fig.2

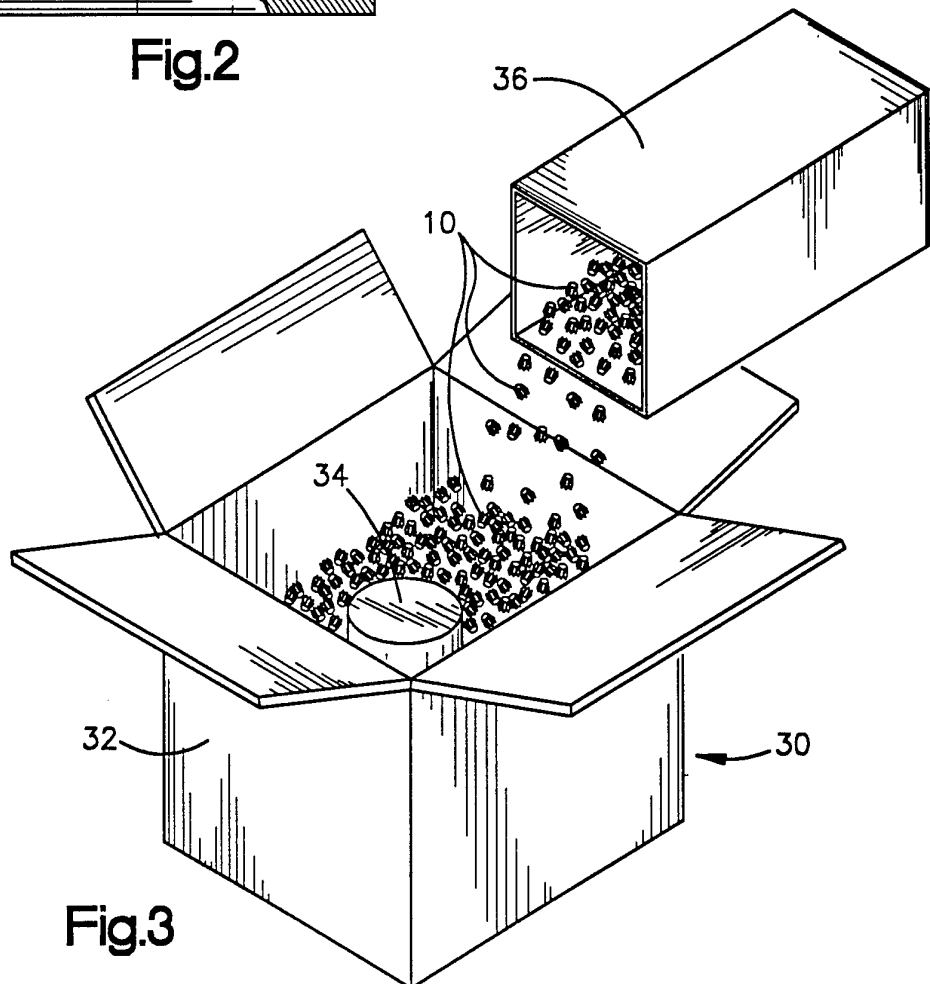


Fig.3

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 93/08720

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>4</sup> According to International Patent Classification (IPC) or to both National Classification and IPC IPC <sup>5</sup> : B 65 D 81/12				
<b>II. FIELDS SEARCHED</b>				
Minimum Documentation Searched <sup>7</sup>				
Classification System	Classification Symbols			
IPC <sup>5</sup>	B 65 D 81/00			
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>6</sup>				
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>8</sup></b>				
Category <sup>9</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>		
A	US, A, 3 074 543 (L.R. STANLEY) 22 January 1963 (22.01.63), the whole document. ---	1, 6-8, 10-21		
A	EP, A1, 0 457 162 (NESTLER WELLPAPPE) 21 November 1991 (21.11.91), the whole document. ---	1-9		
A	DE, U1, 8 622 069 (F. PRIEHS) 13 November 1986 (13.11.86), claims. -----	1-9		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <sup>10</sup> 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         </td> <td style="width: 50%; vertical-align: top; padding: 5px;">           "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            "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.            "Z" document member of the same patent family         </td> </tr> </table>			<sup>10</sup> 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 "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. "Z" document member of the same patent family
<sup>10</sup> 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 "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. "Z" document member of the same patent family			
<b>IV. CERTIFICATION</b>				
Date of the Actual Completion of the International Search 17 December 1993		Date of Mailing of this International Search Report 20. 01. 94		
International Searching Authority EUROPEAN PATENT OFFICE		Signature of Authorized Officer IRMLER e.h.		

# ANHANG

zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

# ANNEX

to the International Search Report to the International Patent Application No.

# ANNEXE

au rapport de recherche international relatif à la demande de brevet international n°

PCT/US 93/08720 SAE 79565

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The Office is in no way liable for these particulars which are given merely for the purpose of information.

La présente annexe indique les membres de la famille de brevets relatifs aux documents de brevets cités dans le rapport de recherche international visée ci-dessus. Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office.

Im Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A 3074543		keine - none - rien	
EP A1 457162	21-11-91	DE A1 4015768	21-11-91
DE U1 8622069	13-11-86	AT A 1952/87 AT B 395238 CH A 673267 DE A1 3726906 DE C2 3726906	15-03-92 27-10-92 28-02-90 18-02-88 27-04-89