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**CLAMPING DEVICE**
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- (56) Prior Art Documents  
**US 5384935**  
**FR 2540789**
- (57) Claim

1. Clamping device for articles to be clamped, such as piles of sheets, display boards, maps, calendars or the like, having two clamping legs which are connected to one another via a spine and of which one leg consists of two sections, which are connected together at a position spaced from the spine by a joint running parallel to the spine, and of which the section connected to the part of the joint extending away from the spine is constructed as an actuating handle and is provided with a clamping element which can be pivoted relative to the other clamping leg from a position in which said clamping element extends away from the spine and releases the article to be clamped into a clamping position in which, said clamping element extends towards the spine and assumes a catch position defined by at least one stop, in which catch position the said clamping element rests resiliently with a free end against the article to be clamped and against the other clamping leg forming one piece with the spine characterized in that the free end of the clamping element is constructed as a curved skid which rolls along the article to be clamped during the clamping operation.



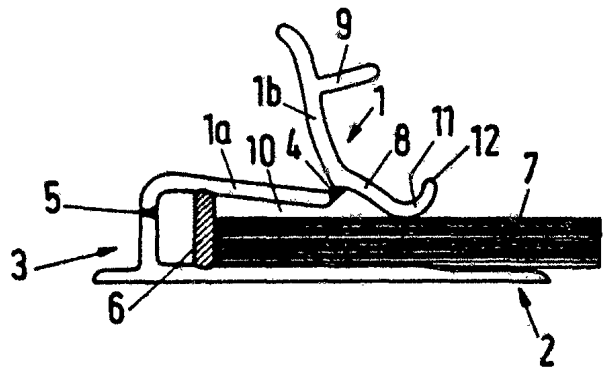
<p>(51) Internationale Patentklassifikation<sup>5</sup>: <b>B42F 9/00</b></p>	<p><b>A1</b></p>	<p>(11) Internationale Veröffentlichungsnummer: <b>WO 95/00344</b> (43) Internationales Veröffentlichungsdatum: <b>5. Januar 1995 (05.01.95)</b></p>
<p>(21) Internationales Aktenzeichen: <b>PCT/DE94/00727</b> (22) Internationales Anmeldedatum: <b>17. Juni 1994 (17.06.94)</b> (30) Prioritätsdaten: <b>P 43 20 907.6 18. Juni 1993 (18.06.93) DE</b> (71) Anmelder: "DURABLE" HUNKE &amp; JOCHHEIM GMBH &amp; CO. KG [DE/DE]; Westfalenstrasse 77-79, D-58636 Iserlohn (DE). (72) Erfinder: MAIER-HUNKE, Horst, Werner; Poths Kreuz 28, D-58640 Iserlohn (DE). RUPPRECHT, Günter; Westerholtstrasse 48, D-59757 Arnsberg (DE). (74) Anwälte: JANDER, Dieter usw.; Leistikowstrasse 2, D-14050 Berlin (DE).</p>	<p>(81) Bestimmungsstaaten: AU, CA, CN, CZ, FI, HU, JP, KR, NO, NZ, PL, RU, SI, SK, europäisches Patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  Veröffentlicht <i>Mit internationalem Recherchenbericht.</i></p> <p style="font-size: 2em; text-align: center;">683473</p>	

(54) Title: CLAMPING DEVICE  
(54) Bezeichnung: KLEMMVORRICHTUNG  
(57) Abstract

In a clamping device with two clamping legs (1, 2) interconnected by a backing (3), one (1) of both clamping legs (1, 2) consists of two sections (1a, 1b) interconnected by a hinge (4). The section (1a) of the clamping leg (1) which faces the backing (3) has a clamping element (8) the free end of which is curved and forms a skid which allows this clamping element (8) to be moved without problems from its initial position to a clamping position.

(57) Zusammenfassung

Bei einer Klemmvorrichtung mit zwei über einem Rücken (3) verbundenen Klemmschenkeln (1, 2) besteht einer (1) der beiden Klemmschenkeln (1, 2) aus zwei Abschnitten (1a, 1b), die über ein Gelenk (4) miteinander verbunden sind. Der dem Rücken (3) zugewandte Abschnitt (1a) des einen Klemmschenkels (1) weist einen Klemmstempel (8) auf, dessen freies Ende (11) bogenförmig gekrümmt ist und eine Gleitkufe bildet, die das problemlose Überführen des Klemmstempels (8) aus seiner Ausgangsposition in eine Klemmposition ermöglicht.



Clamping device

The invention relates to a clamping device for articles to be clamped, such as piles of sheets, display boards, maps, calendars or the like, having two clamping legs which are connected to one another via a spine and of which one consists of two sections, which are connected to one another with spacing from the spine by a joint running parallel to the spine, and of which the section connected to the part of the joint facing away from the spine is constructed as an actuating handle and is provided with a clamping element which can be pivoted from a position in which it faces away from the spine and releases the article to be clamped into a clamping position in which it faces the spine and assumes a catch position, defined by at least one stop, relative to the other clamping leg, in which catch position the said clamping element rests resiliently against the article to be clamped and against the other clamping leg forming one piece with the spine.

A clamping device of the type under consideration made of plastic is known from the Figures 1a to 1c of DE 40 36 882 C1, in which the clamping element is formed by a straight web. The straight shape of the web involves the uppermost sheets of a pile of sheet-like articles being pressed by the web against the spine of the clamping device, possibly forming undesirable folds during this process. In order to prevent the fold formation, a tongue is used in the known device, which tongue projects from the spine between the clamping legs and comes to rest during the clamping operation between the pile of sheet-like articles and the clamping element and prevents direct frictional engagement between the clamping element and the pile of sheet-like articles.

The invention is based on the object of designing a clamping device of the generic type in such a way that, even when dispensing with a tongue which projects into the clamping gap, the risk of fold formation in the region of the edges of sheets of a pile of sheet-like

articles facing the spine of the clamping device is at least considerably reduced, and that it furthermore facilitates the firm clamping of the article to be clamped irrespective of the presence or absence of the tongue. According to the invention, this object is achieved in that the free end of the clamping element is constructed as a curved skid which rolls along the article to be clamped during the clamping operation.

The device according to the invention affords the advantage that, when using it, the stop face between the clamping element and the sheet-like article is comparatively large during the clamping operation due to the skid-like construction of the clamping element, the surface pressure between the element and the article to be clamped is consequently reduced, and the risk of fold formation of sheets of a pile of sheet-like articles is thus ruled out to a great extent.

Further details and features of the invention emerge from the subclaims and the following description of a plurality of particularly advantageous exemplary embodiments illustrated in the attached drawing, in which:

Figures 1-5 show the side view of a clamping device constructed as a clamping rail in different positions of the clamping element during a clamping operation;

Figure 6 shows the side view of a first modified clamping device;

Figure 7 shows the side view of a further modified clamping device; and

Figure 8 shows the side view of a fourth clamping device.

The clamping device according to Figures 1 to 5 has two clamping legs 1 and 2 and a spine 3. The clamping leg 1 is divided into two sections 1a and 1b which are connected to one another via a first joint 4. A second joint 5 connects the section 1a of the clamping leg 1 to the spine 3 of the clamping device.

Extending between the sections 1a of the clamping leg 1 and the clamping leg 2 is a web made of an elastic material which forms a spring 6 which, in conjunction

(Replacement page) - 2a -

with the second joint 5, serves to improve the clamping capacity of the clamping device both in respect of the thickness of the article to be firmly clamped and in respect of durability.

The article 7 to be clamped, which is to be received in each case and is formed in a regular manner by a pile of sheets, is clamped firmly between the clamping leg 2 and a clamping element 8 whose catch position relative to the clamping leg 2 is determined by a stop 9. The clamping element 8 and the stop 9 are formed by webs whose arrangement is such that the spacing A between the spine 3 of the clamping device and the connection point of the first joint 4 to the section 1b of the clamping leg 1 in the catch position is greater than the smallest spacing a between the spine 3 and the point at which the free end of the clamping element 8 is supported on the clamping leg 2 and the article 7 to be clamped (cf. Figure 6).

When the article to be clamped is introduced into the clamping gap 10, the clamping device assumes the position illustrated in Figure 1. From this position, the section 1b of the clamping leg 1 is pivoted in the clockwise direction, as is illustrated in Figures 2 to 5. During the pivoting operation, the free end of the clamping element 8, constructed as a curved skid 11, moves over the pile of sheet-like articles into the clamping position which is illustrated in Figure 5 and in which the tip of the clamping element 8, formed by a spherical cap 12, bears against the pile of sheet-like articles. At the same time, the stop 9 comes to rest against the pile of sheet-like articles. Owing to the inherent elasticity of the clamping legs 1 and 2, consisting of a hard PVC, and of the spine 3 and owing to the spring action of the spring 6 consisting of a permanently elastic plastic material, a satisfactory clamping effect is guaranteed.

Slightly modified clamping devices are illustrated in Figures 6, 7 and 8, the same reference numerals as in the previously described embodiment being used for mutually corresponding parts and only the differences being detailed in the following.

Figure 6 shows a clamping device with a spring 13 which is additionally connected to the spine by means of

an extending arm 14. Moreover, in this embodiment, the clamping leg 2 is provided on its inner side with an antislip coating 15.

In Figure 7, a compression spring 17 is used in addition to a tension spring 16 to assist the clamping force, both springs being connected to the spine 3 over the entire surface. The compression spring 17 is arranged between two projections of the clamping legs 1 and 2 protruding beyond the spine. It proves to be particularly advantageous for the end of the clamping element 8 facing the joint 4 to form a rest 18 in the clamping position for supporting the end, facing away from the spine, of the section 1a of the clamping leg 1 connected to the spine 3. On its outer side, the clamping leg 2 is provided with a layer of adhesive 20 which is covered by a pull-off film 19 and, for example, allows attachment of the clamping device to a writing board (not illustrated) without difficulty.

Finally, Figure 8 shows a clamping device in which a guide tongue 22, being under the effect of a restoring spring 21 and having a catch cam 23, is arranged between the clamping element 8 and the clamping leg 2. The said catch cam 23 must be overcome when the clamping device is opened and consequently constitutes an additional retention of the clamping device in the clamping position.

The clamping device illustrated in the figures can be produced in an extremely cost-effective manner. This is because it is quite possible to construct not only the clamping legs 1 and 2 and the spine 3, but at the same time also the joints 4 and 5 and the springs 6, 13, 16, 17 and 21 as well as the guide tongue 22 as a co-extrusion profile and, by means of separation, to obtain individual clamping devices from the profile produced.

The claims defining the invention are as follows:

1. Clamping device for articles to be clamped, such as piles of sheets, display boards, maps, calendars or the like, having two clamping legs which are connected to one another via a spine and of which one leg consists of two sections, which are connected together at a position spaced from the spine by a joint running parallel to the spine, and of which the section connected to the part of the joint extending away from the spine is constructed as an actuating handle and is provided with a clamping element which can be pivoted relative to the other clamping leg from a position in which said clamping element extends away from the spine and releases the article to be clamped into a clamping position in which, said clamping element extends towards the spine and assumes a catch position defined by at least one stop, in which catch position the said clamping element rests resiliently with a free end against the article to be clamped and against the other clamping leg forming one piece with the spine characterized in that the free end of the clamping element is constructed as a curved skid which rolls along the article to be clamped during the clamping operation.

2. Clamping device according to Claim 1, characterized in that, in the clamping position, the end of the said clamping element extending towards said joint forms a rest, said rest being for supporting the end of the section connected to the spine which extends away from the spine.

3. Clamping device according to Claim 1 or 2, characterized in that a free end of the skid of the clamping element forms a spherical cap which in the clamping position, presses against the article to be clamped.

4. Clamping device according to one or more of Claims 1 to 3, characterized in that, of the two sections of the one clamping leg connected to one another by the joint, the section which lies between the spine and the joint connecting the two sections (1a, 1b) is connected to the spine via a further joint

in the region of the spine, and at least one spring acts on the section between the spine and joint wherein said spring presses the clamping element against the article to be clamped and the other clamping leg in the clamping position.

5 5. Clamping device according to Claim 4, characterized in that the spring is constructed as a tension spring.

6. Clamping device according to Claim 5, characterized in that the spring is formed by an elastic web which connects the section located between the two joints of the one clamping leg  
10 to the other clamping leg.

7. Clamping device according to Claim 5 or 6, characterized in that the elastic web forming the spring is further connected to the spine.

8. Clamping device according to Claim 7, characterized in  
15 that the elastic web forming the spring is connected to the spine over the entire surface of the spine facing the spring.

9. Clamping device according to any one of Claims 1 to 8, characterized in that it includes a further spring which is constructed as a compression spring.

20 10. Clamping device according to Claim 9, characterized in that the compression spring is formed by an elastic web which is arranged between two projections of the two clamping legs protruding beyond the spine.

11. Clamping device according to Claim 10, characterized in  
25 that the elastic web forming the spring is connected to the spine over the entire surface.

12. Clamping device according to any one of Claims 1 to 11, characterized in that the section of the one clamping leg forming the clamping element is provided with the stop which  
30 determines the catch position of the said clamping element,

said stop being provided on the side of the clamping element so as to extend towards the other clamping leg in clamped position.

5 13. Clamping device according to any one of Claims 1 to 12, characterized in that a guide tongue is arranged between the clamping element and the other clamping leg, located opposite the clamping leg consisting of two sections connected to one another by the joint.

10 14. Clamping device according to Claim 13, characterized in that the guide tongue has a catch cam for the clamping element.

15 15. Clamping device according to any one of Claims 4 to 11, characterized in that the spine and the clamping legs consist of hard PVC, and the joints and the spring consist of a permanently elastic plastic material.

15 16. Clamping device according to any one of Claims 1 to 15, characterized in that the clamping leg which has no joint is provided on its inner side with an antislip coating in the region facing towards the clamping element.

20 17. Clamping device according to any one of Claims 1 to 16, characterized in that it consists in total of a section of a coextrusion profile.

25 18. Clamping device according to any one of Claims 1 to 17, characterized in that the clamping leg which has no joint is provided on its outer side with a layer of adhesive which is covered by a pull-off film.

19. A clamping device substantially as hereinbefore described with reference to the accompanying drawings.

DATED: 11 August 1997

CARTER SMITH & BEADLE

Patent Attorneys for the Applicant:

"DURABLE" HUNKE & JOCHHEIM GMBH & CO KG

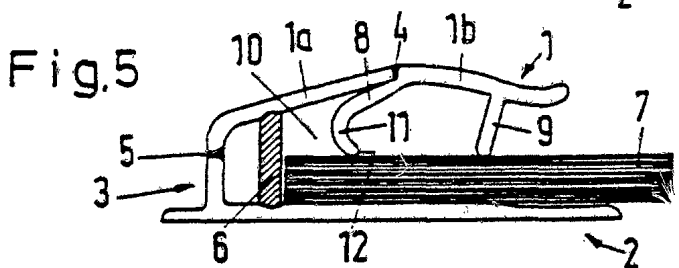
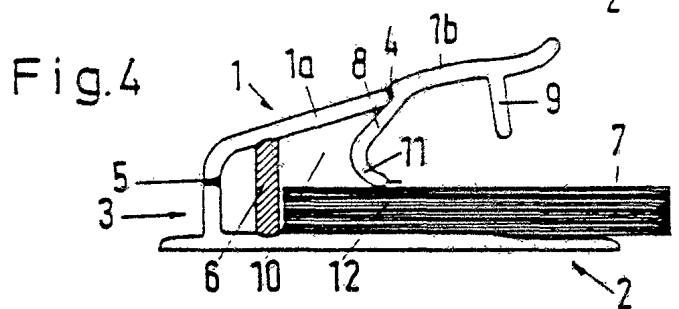
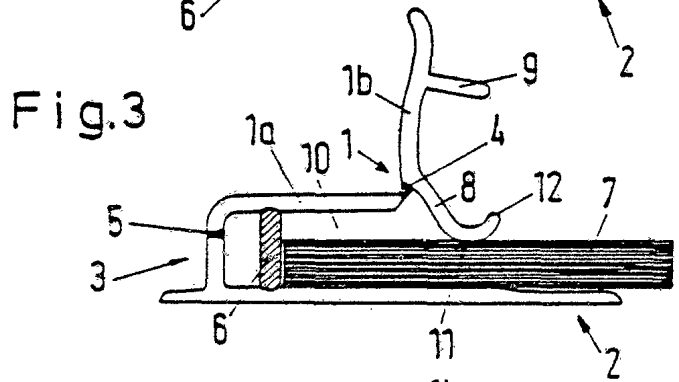
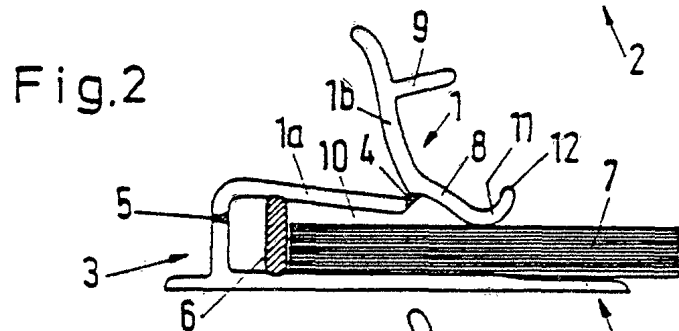
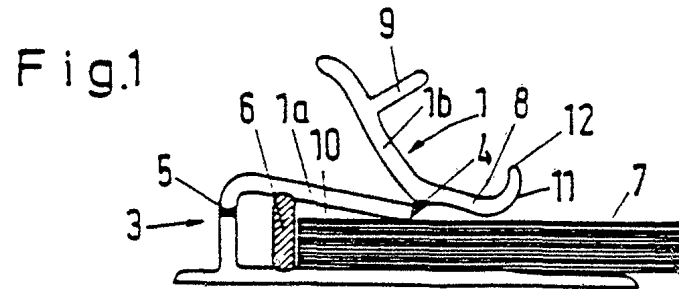


Fig.6

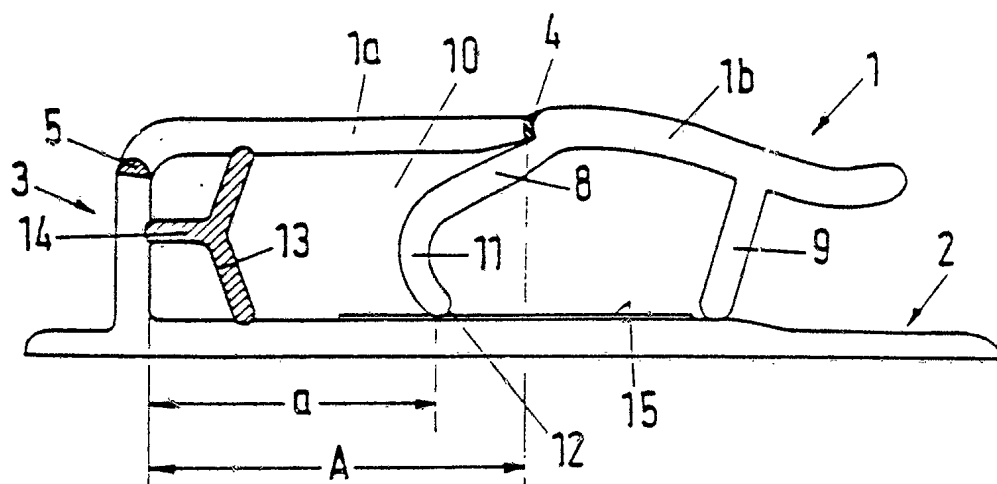


Fig.7

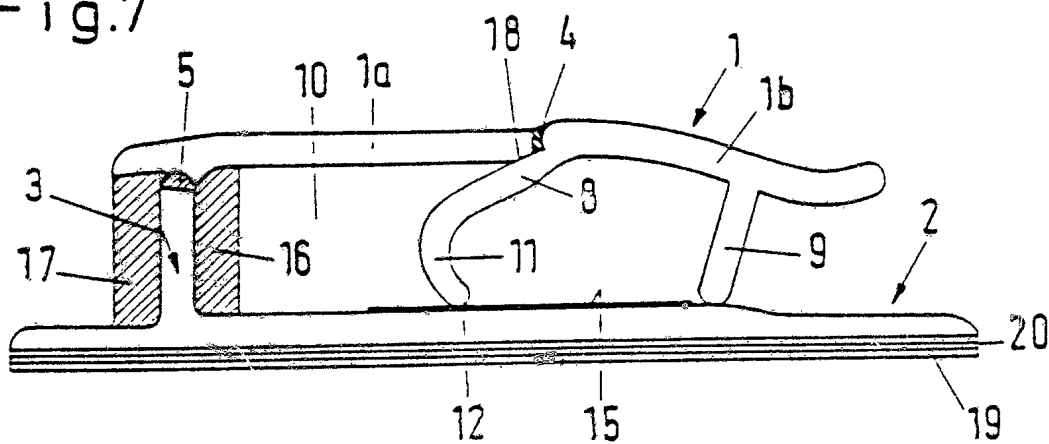
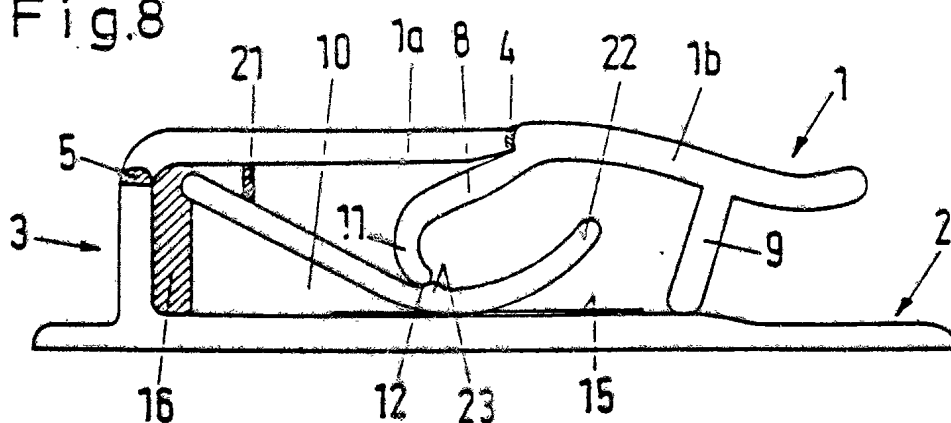


Fig.8



A. CLASSIFICATION OF SUBJECT MATTER  
IPC 5 B42F9/00

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)  
IPC 5 B42F

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 practical, 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, P	EP, A, 0 575 026 ("DURABLE" HUNKE U. JOCHHEIM) 22 December 1993 see the whole document ---	1-18
A	DE, C, 40 36 882 (DESCH MUSTERKARTEN FABRIKATIONS) 4 June 1992 cited in the application see the whole document ---	1
A	FR, A, 2 540 789 (KINGJIM) 17 August 1984 see the whole document -----	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

## \* Special categories of cited documents:

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Date of the actual completion of the international search

26 September 1994

Date of mailing of the international search report

07. 10. 94

Name and mailing address of the ISA

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Authorized officer

Evans, A

## INTERNATIONAL SEARCH REPORT

information on patent family members

Int. Application No.

PCT/DE 94/00727

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0575026	22-12-93	DE-A- 4220406	23-12-93
DE-C-4036882	04-06-92	NONE	
FR-A-2540789	17-08-84	NONE	

**A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES**  
**IPK 5 B42F9/00**

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

**B. RECHERCHIERTE GEBIETE**

Recherchiertes Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)  
**IPK 5 B42F**

Recherchierte aber nicht zum Mindestprüfstoff gehorende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

**C. ALS WESENTLICH ANGESEHENE UNTERLAGEN**

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X, ?	EP, A, 0 575 026 ("DURABLE" HUNKE U. JOCHHEIM) 22. Dezember 1993 siehe das ganze Dokument ---	1-18
A	DE, C, 40 36 882 (DESCH MUSTERKARTEN FABRIKATIONS) 4. Juni 1992 in der Anmeldung erwähnt siehe das ganze Dokument ---	1
A	FR, A, 2 540 789 (KINGJIM) 17. August 1984 siehe das ganze Dokument -----	1

Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

Siehe Anhang Patentfamilie

- \* Besondere Kategorien von angegebenen Veröffentlichungen
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Name und Postanschrift der internationalen Recherchenbehörde Europäisches Patentamt, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx 31 631 epo nl, Fax (+ 31-70) 340-3016	Bevollmächtigter Bediensteter <b>Evans, A</b>
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# INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen

PCT/DE 94/00727

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
EP-A-0575026	22-12-93	DE-A- 4220406	23-12-93
DE-C-4036882	04-06-92	KEINE	
FR-A-2540789	17-08-84	KEINE	