

Commonwealth of Australia
The Patents Act 1952
DECLARATION IN SUPPORT

In support of the (Convention) Application made by:

Dipl.-Ing. Ernst Kreiselmaier Wasser-und Metall-chemie KG,
of Luggendelle 17, D-4660 Gelsenkirchen-Buer, Federal Republic of
Germany
for a patent for an invention entitled: Process for coating tube-sheets or similar
for condensers, coolers, heat exchangers or similar with an anti-
corrosion agent

I (~~We~~) Dr. W. Lankes, Managing Director

of and care of the applicant company do solemnly and sincerely declare as follows:

a) ~~I am (We are) the applicant(s) for the patent~~

or

b) I am (~~We are~~) authorised by the applicant(s) for the patent to make this declaration on its behalf.

Delete the following if not a Convention Application.

The basic application(s) as defined by section 141 (~~142~~) of the Act was (~~were~~) made

in Federal Republic of on 31 August 1985
Germany

~~xxx~~

~~xxx~~

~~xxx~~

~~xxx~~

by the present applicant company

The basic application(s) referred to in this paragraph is (~~are~~) the first application(s) made in
a Convention country in respect of the invention the subject of the application.

a) ~~I am (We are) the actual inventor(s) of the invention~~

or

b) Richard Kreiselmaier, Luggendelle 17, D-4660 Gelsenkirchen-buer
Federal Republic of Germany

is (~~are~~) the actual inventor(s) of the invention and the facts upon which
the applicant company

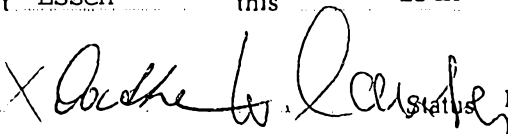
is (~~are~~) entitled to make the application are as follows:

the applicant is a person who would if a patent were granted upon an
application made by the actual inventor, be entitled to have the
patent assigned to it.

Declared at Essen this 25th day of March

87
19

Signed



Status

Declarants name : Dr. W. Lankes

Status :

Managing Director of

Declarant's Name

Dipl.-Ing. Ernst Kreiselmaier GmbH & Co Wasser- und Metall-Chemie KG

F. B. RICE & CO PATENT ATTORNEYS

This form is suitable for any type of Patent Application. No legalisation required.

(12) PATENT ABRIDGMENT (11) Document No. AU-B-63371/86
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 593583

(54) Title
PROCESS FOR COATING TUBE-SHEETS OR SIMILAR FOR CONDENSERS, COOLERS,
HEAT EXCHANGERS OR SIMILAR WITH AN ANTI-CORROSION AGENT

International Patent Classification(s)
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3531150 31.08.85 DE FEDERAL REPUBLIC OF GERMANY

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(71) Applicant(s)
DIPL.ING ERNST KREISELMAIER GMBH

(72) Inventor(s)
RICHARD KREISELMAIER

(74) Attorney or Agent
F.B. RICE & CO.

(56) Prior Art Documents
US 1894957

(57) Claim

1. Process for coating tube sheets and similar structures of condensers, coolers, heat exchangers and similar equipment, with an anti-corrosion medium, comprising the steps of:

(a) inserting plugs into one or more ends of one or more tubes constituting a tube sheet, said plugs protruding outwardly;

(b) placing a single - or multiple - element shuttering in front of said tube sheet by firmly applying said shuttering to the outside of said plugs thereby forming an enclosed intermediate space between the tube sheet and the shuttering;

(c) filling said intermediate space with an anti-corrosion medium to form a coating of the tube sheet; and

(d) removing the shuttering and pulling out the plugs from the end of the tubes.

AU-AI 63371/86

PCT

WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales BüroINTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM ÜBERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation⁴: F28F 19/04, B29C 67/00	A1	(11) Internationale Veröffentlichungsnummer: WO 87/ 01437 (43) Internationales Veröffentlichungsdatum: 12. März 1987 (12.03.87)
(21) Internationales Aktenzeichen: PCT/EP86/00496 (22) Internationales Anmeldedatum: 23. August 1986 (23.08.86) (31) Prioritätsaktenzeichen: P 35 31 150.9 (32) Prioritätsdatum: 31. August 1985 (31.08.85) (33) Prioritätsland: DE (71) Anmelder (für alle Bestimmungsstaaten ausser US): DIPL.-ING. ERNST KREISELMAIER, WASSER- UND-METALL-CHEMIE KG [DE/DE]; Luggendelle 17, D-4660 Gelsenkirchen-Buer (DE). (72) Erfinder; und (75) Erfinder/Anmelder (nur für US): KREISELMAIER, Richard [DE/DE]; Luggendelle 17, D-4660 Gelsenkirchen-Buer (DE). This document contains the amendments made under Article 19 and is correct for printing.	(74) Anwalt: SPALTHOFF, Adolf; Pelmanstrasse 31, Postfach 34 02 20, D-4300 Essen 1 (DE). (81) Bestimmungsstaaten: AT (europäisches Patent), AU, BE (europäisches Patent), CH (europäisches Patent), DE (europäisches Patent), DK, FR (europäisches Patent), GB (europäisches Patent), IT (europäisches Patent), JP, KR, LU (europäisches Patent), NL (europäisches Patent), SE (europäisches Patent), US. Veröffentlicht <i>Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist. Veröffentlichung wird wiederholt falls Änderungen eintreffen.</i> A.O.J.P. 30 APR 1987 AUSTRALIAN 24 MAR 1987 PATENT OFFICE	

(54) Title: PROCESS FOR COATING TUBE-SHEETS OR SIMILAR FOR CONDENSERS, COOLERS, HEAT EXCHANGERS OR SIMILAR WITH AN ANTI-CORROSION AGENT

(54) Bezeichnung: VERFAHREN ZUR BESCHICHTUNG VON ROHRBÖDEN OD.DGL. VON KONDENSATOREN, KÜHLERN, WÄRMETAUSCHERN OD.DGL. MIT EINEM KORROSIONSSCHUTZMITTEL

(57) Abstract

The known method of performing manually the coating of tube-sheets or similar proves to be relatively laborious and consequently very costly. To avoid these disadvantages, the invention aims at providing a coating process which can be performed easily and quickly and ensures the perfect coating of tube-sheets or similar. The invention offers the following characteristics: a) plugs (5) projecting outwards over the front edges of the tubes (2) are inserted in the ends (3) of the latter; b) single or multiple-element shuttering (6) is placed in front of the tube-sheets (1) or similar, being firmly applied against the outside of the plugs (5) and forming an intermediate closed space (8) between the tube-sheets (1) or similar and the shuttering (6); c) the intermediate space (8) is filled with the anti-corrosion agent, a coating (9) being formed on the tube-sheets or similar; d) after a specific time the shuttering (6) is removed and the plugs (5) withdrawn from the ends (3) of the tubes (2).

(57) Zusammenfassung

Die bisher bekannte Ausführung der Beschichtungsarbeiten von Rohrböden od.dgl. von Hand erweist sich als vergleichsweise umständlich und damit sehr aufwendig. Um diese Nachteile zu vermeiden liegt der Erfindung die Aufgabe zugrunde, ein derartiges Beschichtungsverfahren zu schaffen, welches in einfacher und schneller Weise durchführbar ist und eine einwandfreie Beschichtung der Rohrböden od.dgl. gewährleistet. Erfindungsgemäss wird dies durch folgende Merkmale erreicht: a) in die Enden (3) der Rohre (2) werden über deren Stirnkanten nach aussen vorragende Stopfen (5) eingesetzt; b) vor die Rohrböden (1) od.dgl. werden ein- oder mehrteilige Schalungen (6) unter fester Anlage an die Aussenseiten der Stopfen (5) und Bildung eines in sich geschlossenen Zwischenraumes (8) zwischen Rohrböden (1) od.dgl. und Schalung (6) gesetzt; c) der Zwischenraum (8) wird mit dem Korrosionsschutzmittel unter Bildung einer Beschichtung (9) der Rohrböden (1) od.dgl. verfüllt; d) nach einer bestimmten Zeit werden die Schalungen (6) abgenommen und die Stopfen (5) aus den Enden (3) der Rohre (2) entfernt.



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PROCESS FOR COATING TUBE-SHEETS OR THE LIKE FOR CONDENSERS, COOLERS,
HEAT EXCHANGERS OR THE LIKE WITH AN ANTI-CORROSION MEDIUM

The invention relates to a method for coating of tube sheets or the like
for condensers, coolers, heat exchangers or the like, with an anti-
5 corrosion medium.

It is known to provide the tube sheets or the like of condensers,
coolers, heat exchangers with a coating of plastic material in order to
protect them against corrosion. For this purpose it is required to
expose the tube sheets or the like, if this has not already been done,
10 to enlarge the ends of the tubes imbedded therein and to close their end
by means of plugs made of synthetic material. Around these plastic
plugs, a sealing liquid is applied to the tube sheets, in order to pre-
vent a penetration of the craters formed around the tube ends, in tubes
which have already been in use, or in order to prevent crater formation
15 in new tube sheets. After these operations are completed, the anti-
-corrosion medium is applied by hand like a primer mass, and namely
all the way over the corks, in order to insure a complete coating.
After the anti-corrosion medium has hardened, it is removed by grind-
ing in the area of the corks, so that these can be removed individually.
20 The application of coatings of anticorrosion medium to tube sheets or the
like has proven to be the best method, but it is comparatively cumber-
some, and thus very expensive, to carry out the afore-mentioned process.

Departing from this state of the art, the invention has the object to
create a process for the coating of tube sheets or the like



of condensers, coolers, heat exchangers and the like with an anti-corrosion medium, by providing a process which can be carried out in a simple and rapid manner and which insures a satisfactory coating of the tube sheets or the
5 like.

Accordingly, the present invention consists in a process for coating tube sheets and similar structures of condensers, coolers, heat exchangers and similar equipment, with an anti-corrosion medium, comprising the
10 steps of:

(a) inserting plugs into one or more ends of one or more tubes constituting a tube sheet, said plugs protruding outwardly;

(b) placing a single - or multiple - element
15 shuttering in front of said tube sheet by firmly applying said shuttering to the outside of said plugs thereby forming an enclosed intermediate space between the tube sheet and the shuttering;

(c) filling said intermediate space with an
20 anti-corrosion medium to form a coating of the tube sheet; and

(d) removing the shuttering and pulling out the plugs from the end of the tubes.

This way, it is possible to introduce the
25 anti-corrosion medium in the intermediate space for the information of the coating of the tube sheets or the like, through pouring, spraying, etc., which can be accomplished in a relatively short time. Due to the fact that the shutterings are pressed against the outside of the plugs,
30 it is insured that the plugs themselves are not covered by the coating medium, so that after the removal of the shutterings, the plugs can be pulled out without a special grinding process, with no further ado.



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In order to facilitate the extraction process, the plugs are provided with one or several bores, whereinto a mandrel or the like can be inserted. By carrying out the process according to the invention, a uniform, satisfactory coating can be achieved in a comparatively short time.

The tube ends can be expanded conically or in a curved manner, whereby due to the shaping of the outer contours of the plugs it is insured that the tube ends extending over the tube sheeting or the like are surrounded on all sides by the corrosion-prevention medium, and that optionally trumpet-shaped inlets result, which prove to be particularly advantageous from the point of view of the flow technique.

As an anti-corrosion medium an epoxy resin is used, which insures a high degree of corrosion protection.

An embodiment example of the invention is closer explained with the aid of the drawing, which shows a sectioned top view of a marginal area of a tube end in a tube sheet, in an enlarged representation.

The tube sheet, of for instance a condenser, is marked with 1, therein a multitude of tubes is embedded, but only a walling of one tube 2 is illustrated.

20 The tubes 2 are fastened to the tube sheet 1 at their ends ³~~2 (sic)~~ through expansion rolling. The tube sheet 1 has ~~have~~ fittings marked *shown as reference numeral* with 4, at the edges surrounding the bores for receiving the tubes 2.



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After expansion of the ends 3 of the tube 2, plugs 5 of synthetic material are inserted therein, which plugs extend outwardly, over the front edges of the ends 3 of the tubes 2.

5 In front of the tube sheets 1, single- or multiple-element shutterings 6 are placed, namely firmly pressed against the outer side of the plug 5. For this purpose, clamping means are provided, which are indicated by arrows 7. These apply a uniform pressure on all the plugs inserted in one tube walling 1. Screw clamps, cylinder-piston units, etc, can serve as clamping means.

10 The single- or multiple-element shutterings 6 are built in such a manner as to form an enclosed intermediate space 8 between the outside of the tube sheets 1 and the inside of the shuttering 6.

The intermediate space 8 is filled with an anti-corrosion medium, so that a coating 9 results on the outside of the tube sheeting. The 15 freely protruding ends 3 of the tubes 2 extend into the coating 9, so that these are surrounded on all sides by the anti-corrosion medium.

By shaping the outside of the plugs 5 it is possible to impart the desired shape to the in- and outlets of the tubes 2, so that these can have a trumpet shaped configuration, as shown in the embodiment 20 example.

After the hardening of the anti-corrosion medium, and thereby after the formation of the coating 9, the shuttering 6 can be removed by



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releasing the clamping means 7, whereafter the freely exposed plugs 5 can be easily and quickly extracted.

With the aid of the process according to the invention, it is possible to simplify and accelerate considerably the coating operation on the 5 tube sheets or the like of condensers, coolers, heat exchangers or the like, and to reduce considerably the downtime.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Process for coating tube sheets and similar structures of condensers, coolers, heat exchangers and similar equipment, with an anti-corrosion medium, comprising the steps of:

(a) inserting plugs into one or more ends of one or more tubes constituting a tube sheet, said plugs protruding outwardly;

(b) placing a single - or multiple - element shuttering in front of said tube sheet by firmly applying said shuttering to the outside of said plugs thereby forming an enclosed intermediate space between the tube sheet and the shuttering;

(c) filling said intermediate space with an anti-corrosion medium to form a coating of the tube sheet; and

(d) removing the shuttering and pulling out the plugs from the end of the tubes.

2. Process according to claim 1, characterized in that the ends of the tubes imbedded in the tube sheets are subjected to expansion.

3. Process according to claims 1 or 2, characterized in that the plugs are shaped to adjust to the requirements of the inflow conditions.

4. Process according to any one of claims 1 to 3, characterized in that the ends of the tubes are expanded conically or in a trumpet-like shape.

5. Process according to any one of claims 1 to 4, characterized in that an epoxy resin is used as the anti-corrosion medium.

DATED this 16th day of November 1989

DIPL.-ING. ERNST KREISELMAIER
WASSER-UND METALL-CHEMIE KG
Patent Attorneys for the
Applicant:

F.B. RICE & CO.



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ABSTRACT:

" Process for coating tube sheets or the like of condensers, coolers, heat exchangers or the like, with an anti-corrosion medium"

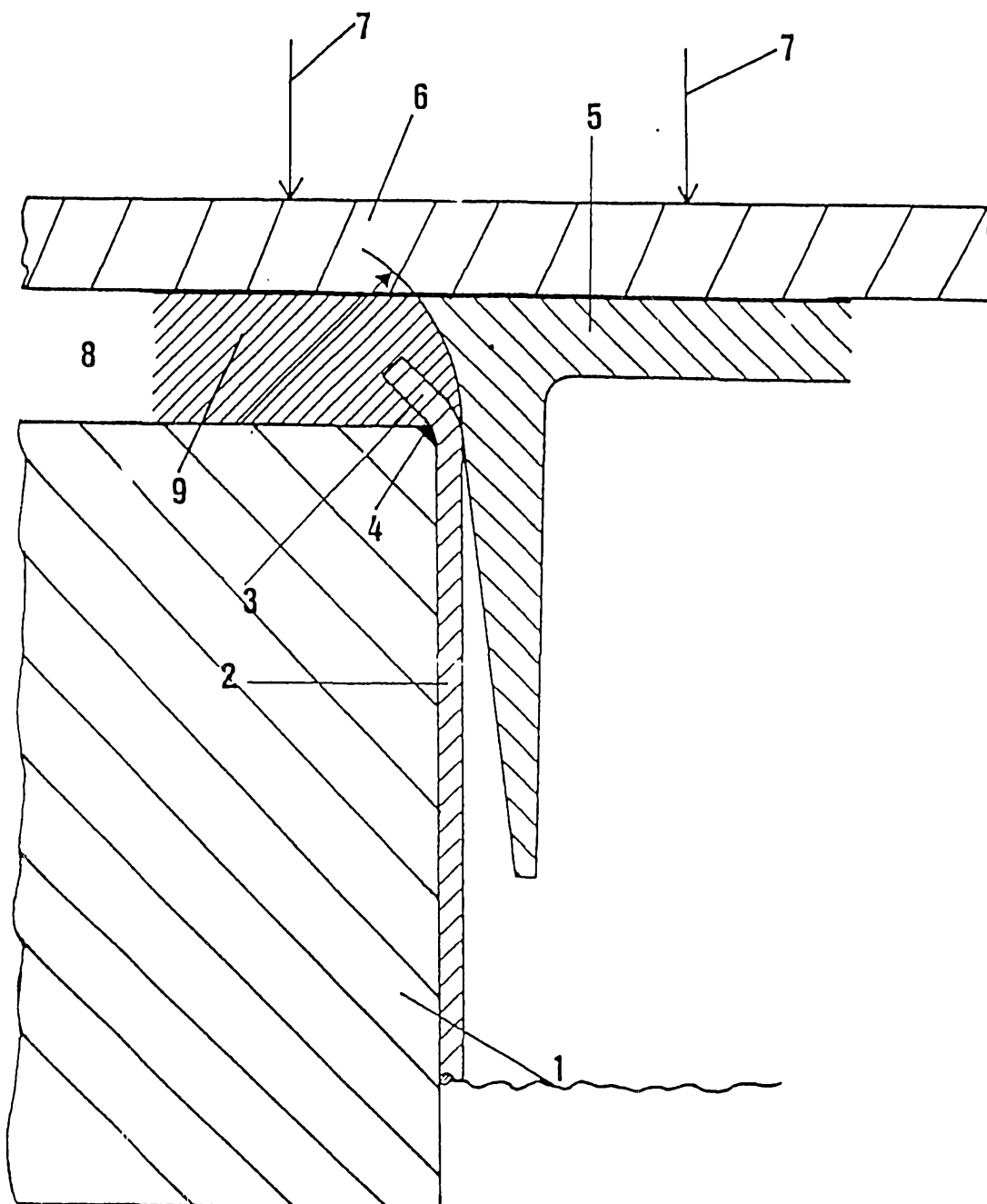
The heretofore-known execution of coating operations in tube sheets or the like by hand proves to be comparatively cumbersome, and therefore
5 very expensive. In order to avoid these disadvantages, the invention has the object to create such a coating process, which can be carried out easily and fast and insures a satisfactory coating of the tube sheet or the like. In accordance with the invention, this object is attained through the following features:

- 10 a/ In the ends (3) of the tubes (2) plugs (5), protruding outwardly over the frontal edges of the tubes, are inserted;
b/ in front of the tube sheets (1) or the like, single- or multiple-element shutterings (6) are placed, by firmly applying them against the outside of the plugs (5) and forming an enclosed intermediate
15 space (8) between the tube sheets (1) or the like and the shuttering (6)
c/ the intermediate space (8) is filled with an anti-corrosion medium, by forming the coating (9) of the tube sheets (1);
d/ after a certain time, the shutterings (6) are removed and the plugs (5) are extracted from the ends (3) of the tubes (2).

(Figure)

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INTERNATIONAL SEARCH REPORT

International Application No. PCT/EP 86/00496

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl.⁴: F 28 F 19/04; B 29 C 67/00																	
II. FIELDS SEARCHED Minimum Documentation Searched ⁷ <table style="width: 100%; border: none;"> <tr> <td style="width: 20%; border: none;">Classification System</td> <td style="border: none;">Classification Symbol⁸</td> </tr> <tr> <td style="border: none; height: 40px; vertical-align: top;">Int.Cl.⁴</td> <td style="border: none; vertical-align: top;">F 28 F; B 29 C</td> </tr> </table> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁹			Classification System	Classification Symbol ⁸	Int.Cl. ⁴	F 28 F; B 29 C											
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Int.Cl. ⁴	F 28 F; B 29 C																
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁵ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: left;">Category [*]</th> <th style="width: 60%; text-align: left;">Citation of Document, ¹¹ with Indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 30%; text-align: left;">Relevant to Claim No. ¹³</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Y</td> <td style="vertical-align: top;">US, A, 1894957 (LUCKE et al.) 24 January 1983, see page 1, lines 89-100; page 2, lines 1-15; figure 2 --</td> <td style="vertical-align: top;">1-4</td> </tr> <tr> <td style="vertical-align: top;">Y</td> <td style="vertical-align: top;">DE, A, 3152899 (ESPO WIERDEN) 25 August 1983, see abstract; figures 1-3 --</td> <td style="vertical-align: top;">1-4</td> </tr> <tr> <td style="vertical-align: top;">A</td> <td style="vertical-align: top;">JP, A, 60134197 (TOSHIBA K.K.) 17 July 1985, see figure 2 & Patents Abstracts of Japan, volume 9, no. 297 (M-432) (2020) 25 November 1985 --</td> <td style="vertical-align: top;">5</td> </tr> <tr> <td style="vertical-align: top;">A</td> <td style="vertical-align: top;">GB, A, 1175157 (KREISELMAIER) 23 December 1969, see page 1, lines 52-70; page 2, lines 10-35; figure 2 -----</td> <td style="vertical-align: top;">1-5</td> </tr> </tbody> </table>			Category [*]	Citation of Document, ¹¹ with Indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	Y	US, A, 1894957 (LUCKE et al.) 24 January 1983, see page 1, lines 89-100; page 2, lines 1-15; figure 2 --	1-4	Y	DE, A, 3152899 (ESPO WIERDEN) 25 August 1983, see abstract; figures 1-3 --	1-4	A	JP, A, 60134197 (TOSHIBA K.K.) 17 July 1985, see figure 2 & Patents Abstracts of Japan, volume 9, no. 297 (M-432) (2020) 25 November 1985 --	5	A	GB, A, 1175157 (KREISELMAIER) 23 December 1969, see page 1, lines 52-70; page 2, lines 10-35; figure 2 -----	1-5
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A	GB, A, 1175157 (KREISELMAIER) 23 December 1969, see page 1, lines 52-70; page 2, lines 10-35; figure 2 -----	1-5															
[*] Special categories of cited documents: ¹⁰ "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. "Δ" document member of the same patent family																	
IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> Date of the Actual Completion of the International Search 1 December 1986 (01.12.86) International Searching Authority EUROPEAN PATENT OFFICE </td> <td style="width: 50%; border: none;"> Date of Mailing of this International Search Report 15 January 1987 (15.01.87) Signature of Authorized Officer </td> </tr> </table>			Date of the Actual Completion of the International Search 1 December 1986 (01.12.86) International Searching Authority EUROPEAN PATENT OFFICE	Date of Mailing of this International Search Report 15 January 1987 (15.01.87) Signature of Authorized Officer													
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO.

PCT/EP 86/00496 (SA 14440)

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 05/12/86

The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

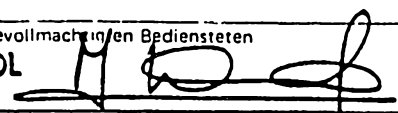
Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 1894957		None	
DE-A- 3152899	25/08/83	DE-A,C 3142921	11/05/83
JP-A-60134197	17/07/85	None	
GB-A- 1175157	23/12/69	US-A- 3448804	10/06/69

For more details about this annex :
see Official Journal of the European Patent Office, No. 12/82

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen **PCT/EP 86/00496**

I. KLASSEIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben) ⁶		
Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC		
Int. Cl. 4: F 28 F 19/04; B 29 C 67/00		
II. RECHERCHIERTE SACHGEBIETE		
Recherchierter Mindestprüfstoff ⁷		
Klassifikationssystem	Klassifikationssymbole	
Int. Cl. 4	F 28 F; B 29 C	
Recherchierte nicht zum Mindestprüfstoff gehorende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen ⁸		
III. EINSCHLÄGIGE VERÖFFENTLICHUNGEN⁹		
Art*	Kennzeichnung der Veröffentlichung ¹¹ , soweit erforderlich unter Angabe der maßgeblichen Teile ¹²	Betr. Anspruch Nr. ¹³
Y	US, A, 1894957 (LUCKE et al.) 24. Januar 1983, siehe Seite 1, Zeilen 89-100; Seite 2, Zeilen 1-15; Figur 2	1-4
Y	DE, A, 3152899 (ESPO WIERDEN) 25. August 1983, siehe Zusammenfassung; Figuren 1-3	1-4
A	JP, A, 60134197 (TOSHIBA K.K.) 17. Juli 1985, siehe Figur 2 & Patents Abstracts of Japan, Band 9, Nr. 297 (M-432) (2020) 25. November 1985	5
A	GB, A, 1175157 (KREISELMAIER) 23. Dezember 1969, siehe Seite 1, Zeilen 52-70; Seite 2, Zeilen 10-35; Figur 2	1-5

* Besondere Kategorien von angegebenen Veröffentlichungen¹⁰ "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
1. Dezember 1986		15 JAN. 1987
Internationale Recherchenbehörde		Unterschrift des bevollmächtigten Bediensteten
Europäisches Patentamt		M. VAN MOL 

ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT ÜBER DIE

INTERNATIONALE PATENTANMELDUNG NR. PCT/EP 86/00496 (SA 14440)

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 05/12/86

Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
US-A- 1894957		Keine	
DE-A- 3152899	25/08/83	DE-A,C 3142921	11/05/83
JP-A-60134197	17/07/85	Keine	
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Für nähere Einzelheiten zu diesem Anhang :
siehe Amtsblatt des Europäischen Patentamts, Nr. 12/82