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MANHOLE COVER

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(56) Prior Art Documents
AU 616694 25013/88 E03F 05/06
AU 557484 29911/84 E03F 05/06
FR 2456169

(57) Claim

1. Manhole cover which comprises a frame for anchoring in the ground and having a lower-lying supporting shoulder at least partially surrounding the frame aperture, and a grating or cover for resting on said shoulder and fitting flush with the frame aperture, in order to secure the grating or cover at least one securing element being attached to the frame or to the grating or cover, said securing element comprising a resilient supporting element and a locking element adjoining and supported by the supporting element for engaging with a locking surface on the grating or cover or on the frame, from which it can be pulled back by elastic deformation of the supporting element, characterised in that the securing element is mounted on the frame or on the grating or cover and is secured by a snap-in locking arrangement.

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(1) Anmelder (für alle Bestimmungsstaaten ausser US): VON ROLL AG [CH/CH]; CH-4563 Gerlafingen (CH). (72) Erfinder; und (75) Erfinder/Anmelder (nur für US): SPIESS, Hansruedi [CH/CH]; Pervanches 31, CH-2800 Delémont (CH). GALVANETTO, François [CH/CH]; Le Lomont 7, CH-2942 Alliez (CH). (74) Anwalt: R.A. EGLI & CO.; Horneggstrasse 4, CH-8008 Zürich (CH).		Veröffentlicht Mit internationalem Recherchenbericht. Mit geänderten Ansprüchen.	

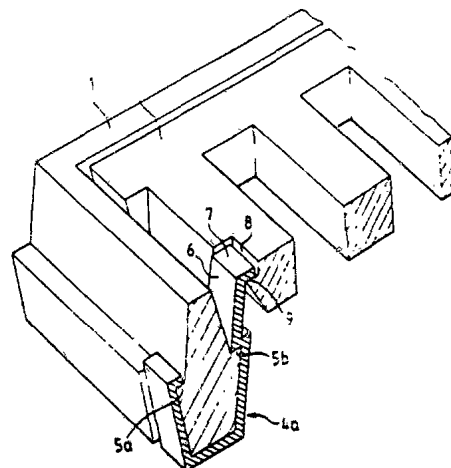
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(54) Title: MANHOLE COVER

(54) Bezeichnung: SCHACHTABDECKUNG

(57) Abstract

The invention concerns a manhole cover with a frame (1) and a grating (3) or cover fitting flush with the frame (1). In order to secure the grating (3) or cover in such a way that it can be easily removed and put back in place, a one-piece securing element (4a) made of spring steel is attached to the frame (1), the securing element (4a) having a locking element (7) at the end of a clip-like retaining element (6) extending upwards at an angle. The locking element (7) engages against a surface (9) at the bottom of a recess (8) in the surface of the grating (3) or cover. To unlock the manhole cover, the locking element (7) can be pulled away from the surface (9) with a special tool, e.g. pair of pliers, the retaining element (6) being bent back elastically. The securing element (4a) is mounted on the frame (1), embracing shoulders (5a, 5b) so that it is secured by a snap-action connection. The securing element can also be attached to the cover or grating and engage against a surface on the frame.



(57) Zusammenfassung

Eine Schachtabdeckung besteht aus einem Rahmen (1) und einem denselben fluchtend verschliessenden Rost (3) oder Deckel. Zwecks leichte Montage und Demontage erlaubender Sicherung des Rostes (3) oder Deckels ist am Rahmen (1) ein einstückig aus Federstahl gefertigtes Sicherungsteil (4a) befestigt, das am Ende eines schräg von unten nach oben verlaufenden laschenartigen Halteteils (6) ein Verriegelungsteil (7) aufweist. Dieses steht mit einer den Grund einer Ausnehmung (8) an der Oberfläche des Rostes (3) oder Deckels bildenden Verriegelungsfläche (9) im Eingriff. Zur Entriegelung kann das Verriegelungsteil (7) mit einem Spezialwerkzeug, z.B. einer Zange, unter elastischer Deformation des Halteteils (6) von der Verriegelungsfläche (9) zurückgezogen werden. Das Sicherungsteil (4a) ist auf den Rahmen (1) aufgesteckt und umgreift Schultern (5a, b), so dass es durch eine Schnappverbindung gesichert ist. Umgekehrt kann das Sicherungsteil auch am Deckel oder Rost befestigt sein und mit einer Verriegelungsfläche am Rahmen im Eingriff stehen.

Manhole Cover

The invention relates to a manhole cover which comprises a frame anchored in the ground and having a lower-lying supporting shoulder at least partially surrounding the frame aperture, and a grating or cover resting on said shoulder and fitting flush with the frame aperture.

Manhole covers of this kind must be secured in such a way that the grating or cover cannot jump out of the frame due to the action of vehicles driving over the top and, as far as possible, also in such a way that they cannot be removed by unauthorised persons. In a known solution, grating and frame are screwed together.

It is the object of the invention to indicate a manhole cover of the generic type with a securing device which allows the grating or cover to be fitted and removed as easily as possible.

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The present invention provides a manhole cover which comprises a frame for anchoring in the ground and having a lower-lying supporting shoulder at least partially surrounding the frame aperture, and a grating or cover for resting on said shoulder and fitting flush with the frame aperture, in order to secure the grating or cover at least one securing element being attached to the frame or to the grating or cover, said securing element comprising a resilient supporting element and a locking element adjoining and supported by the supporting element for engaging with a locking surface on the grating or cover or on the frame, from which it can be pulled back by elastic deformation of the supporting element, characterised in that the securing element is mounted on the frame or on the

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grating or cover and is secured by a snap-in locking arrangement.

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The invention is explained in greater detail below with reference to Figures which represent only embodiments:

- Fig. 1a shows a plan view of a first manhole cover according to the invention,
- 5 Fig. 1b shows a sectioned perspective representation of the manhole cover according to Fig. 1a,
- Figs. 2a - c show the opening of the manhole cover according to Figs. 1a, 1b, in section,
- 10 Fig. 3 shows a second manhole cover according to the invention, in perspective,
- Fig. 4 shows a further manhole cover according to the invention, in section,
- 15 Figs. 5a - f show securing elements and their anchoring on the frame in the case of various manhole covers according to the invention, in section,
- Figs. 6a,b show a further manhole cover according to the invention,
- 20 Fig. 7 shows a variant of the manhole cover according to Figs. 6a,b, in section,
- Fig. 8 shows a further manhole cover according to the invention, in section,
- Fig. 9 shows a manhole cover according to the



invention with a securing element attached to the grating, in section, and

Fig. 10 shows a variant of the manhole cover according to Fig. 9, likewise in section.

The manhole cover depicted in Figs. 1a, 1b has a frame 1 with a two-part, lower-lying supporting shoulder 2, on which a grating 3 rests.

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According to the invention, two securing elements 4a,b arranged diametrically opposite to one another are attached to the frame. They are preferably of one-piece spring-steel construction and mounted on the frame 1. The securing element 4a here fits over the top of shoulders 5a,b on both sides, thus producing a snap-in connection which secures it on the frame 1. The securing element 4a comprises a ^{supporting or} retaining element 6, which is designed as a resilient tab extending obliquely upwards and adjoining which is a locking element 7. On its upper surface, the grating 3 has a recess 8, the base of which is formed by a locking surface 9. The locking element 7 and the locking surface 9 are in engagement with one another and in this way secure the grating 3. The second securing element 4b is preferably of identical design to the first locking element 4a but can also be replaced by some other device, e.g. by a projection on the frame which engages in a recess on the surface of the grating (for further possibilities see below).

30 Suitable materials for securing elements are, in particular, metallic materials, in particular spring steel and other steel grades or cast iron containing spheroidal graphite, as well as corrosion-resistant plastics.

35 As depicted in Figs. 2a - c, the manhole cover is unlocked by pulling back the locking element 7 from the locking surface 9, the retention part 6 being elastically deformed.

The grating 3 can then simply be lifted off. To prevent theft, it is advantageous to design the securing element 4a and, in particular, to dimension the retaining element 6 in such a way that a deformation sufficient for the unlocking
 5 of the grating 3 is only possible using a special tool, e.g. a pair of pliers applied to the end of the locking element 7 and supported against the frame 1.

The mounting of the grating is facilitated by the fact that
 10 it is chamfered somewhat at the bottom. As soon as it has reached the closure position, the lock snaps in automatically.

Fig. 3 shows a manhole cover according to the invention in
 15 which a cover 3' can be fitted positively into the frame 1 - projections 10 on the frame 1 engaging in recesses 11 on the cover 3' - in such a way that a single securing element 4 is sufficient. The latter is here flanked by projections 10 and thereby especially protected.

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Fig. 4 shows a manhole cover according to the invention likewise having only one securing element 4, which is of identical design to the manhole covers already described. Diametrically opposite the securing element 4, the edge of
 25 the cover 3' is chamfered and projects under a correspondingly chamfered overhanging edge part of the frame 1, with the result that the cover 3' is also locked there.

Figs. 5a - f show various possibilities for the design of
 30 the securing elements 4 and their anchoring on the frame 1. In the embodiment according to Fig. 5a, the securing element 4 is particularly easy to mount and remove since the shoulders of the embodiments described above are absent. The securing element 4 is nevertheless adequately
 35 secured by the projecting edge 12, over which the securing element 4 engages.

In the case of the securing elements according to Figs. 5b - e, release is made easier in comparison with the embodiments described above, because of the greater length of the retaining element 6 in combination with the same cross-section of the latter. The embodiments according to Figs. 5d,e have the advantage that the securing element 4 can in each case be mounted on the frame 1 from above, i.e. it can readily be mounted subsequently and exchanged more easily.

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In the case of the securing element according to Fig. 5f, engagement over angular shoulders or projections is avoided, facilitating its fitting and removal. Since the securing element 4 cannot be removed without considerable elastic deformation, it is nevertheless reliably secured on the frame 1.

Figs. 6a,b show a manhole cover according to the invention which can also be of sealing design. The securing element 4 is embedded in the frame 1. As indicated by an arrow, the locking element 7 presses with a residual stress against the locking surface 9, which is inclined towards the edge of the recess 8 for the purpose of easier unlocking. The cover 3' is thus pressed against the frame 1.

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Fig. 7 shows a variant of the embodiment according to Figs. 6a,b with a securing element 4 mounted with engagement over a shoulder 5.

Fig. 8 depicts a manhole cover according to the invention in which the recess 8 is formed on the side of the cover 3' and is limited towards the top. In this embodiment, access to the securing element 4 without special tools is made more difficult and particularly effective protection against theft is provided.

Fig. 9 shows an embodiment in which the securing element 4

is embedded in the grating 3 and its retaining element 6 is designed as a resilient tab extending obliquely downwards. The locking element 7 is in engagement with a locking surface 9 in a recess 8 on the underside of the frame 1.

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Finally, Fig. 10 shows a variant of the embodiment according to Fig. 9 in which the securing element 4 is mounted on the grating 3 and locked by means of snapping in. In this embodiment, the securing element 4 can be
10 removed very easily after the removal of the grating 3.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Manhole cover which comprises a frame for anchoring in the ground and having a lower-lying supporting shoulder at least partially surrounding the frame aperture, and a grating or cover for resting on said shoulder and fitting flush with the frame aperture, in order to secure the grating or cover at least one securing element being attached to the frame or to the grating or cover, said securing element comprising a resilient supporting element and a locking element adjoining and supported by the supporting element for engaging with a locking surface on the grating or cover or on the frame, from which it can be pulled back by elastic deformation of the supporting element, characterised in that the securing element is mounted on the frame or on the grating or cover and is secured by a snap-in locking arrangement.
2. Manhole cover according to Claim 1, characterised in that the locking surface forms the base of a recess on the grating or cover or on the frame in which the locking element engages.
3. Manhole cover according to Claim 2, characterised in that the recess is formed on the upper surface of the grating or cover or on the underside of the frame and the supporting element is designed as a resilient tab extending obliquely upwards or downwards.
4. Manhole cover according to Claim 2, the securing element being attached to the frame, characterised in that the recess is formed on the side of the grating or cover and is limited towards the top.



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5. Manhole cover according to one of Claims 2 to 4, characterised in that the locking surface is inclined towards the edge of the recess.

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6. Manhole cover according to one of Claims 1 to 5, characterised in that the ~~retaining~~^{supporting} element presses the locking element with a residual stress against the locking surface.

7. Manhole cover according to one of Claims 1 to 6, characterised in that the securing element is manufactured in one piece from a metallic material.

8. Manhole cover according to Claim 7, characterised in that the metallic material is steel or cast iron containing spheroidal graphite.

9. Manhole cover according to one of Claims 1 to 6, characterised in that the securing element is manufactured in one piece from plastic.

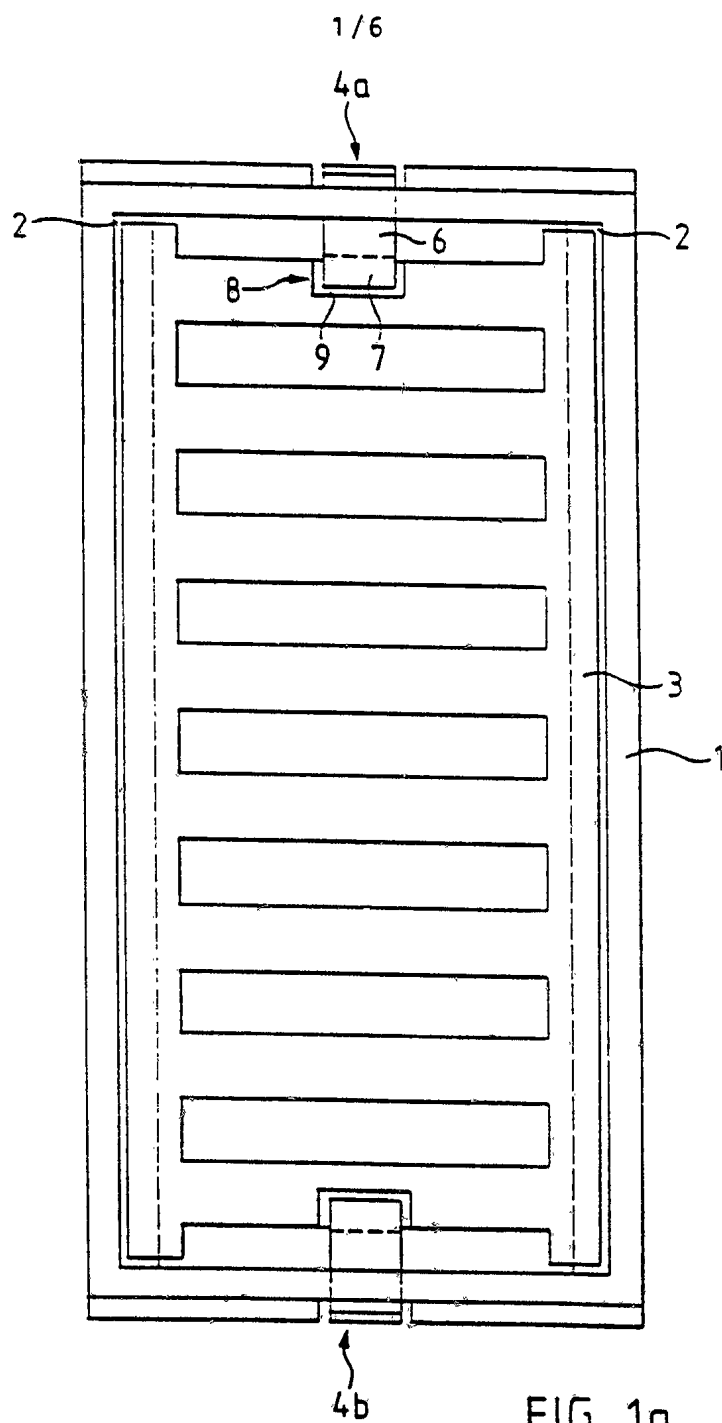
DATED THIS 22ND DAY OF MAY, 1992

VON ROLL AG

By Its Patent Attorneys:

GRIFFITH HACK & CO.,

Fellows Institute of Patent
Attorneys of Australia



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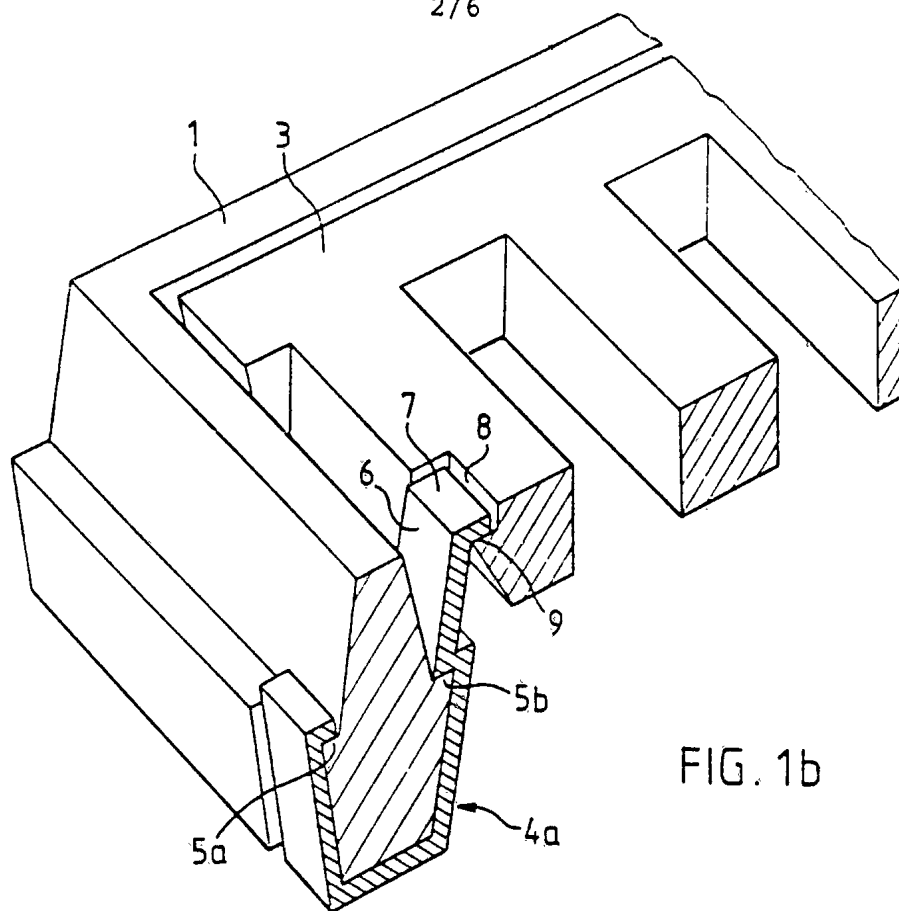


FIG. 1b

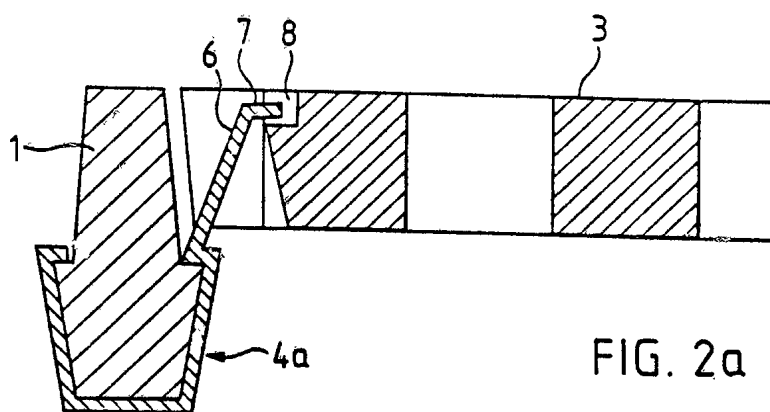
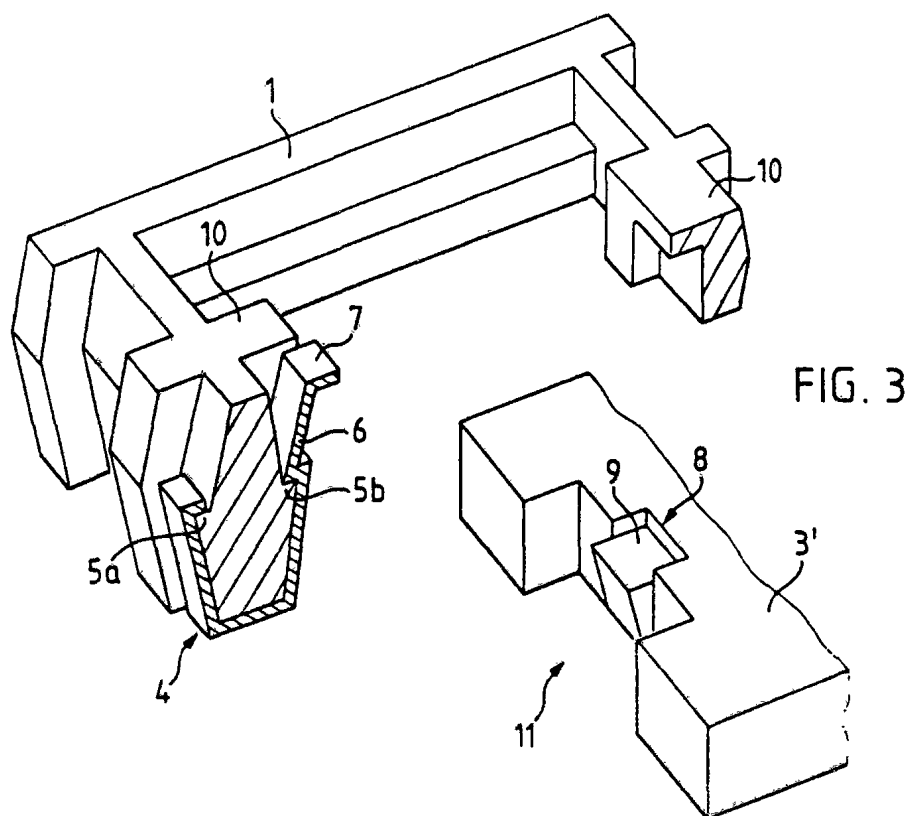
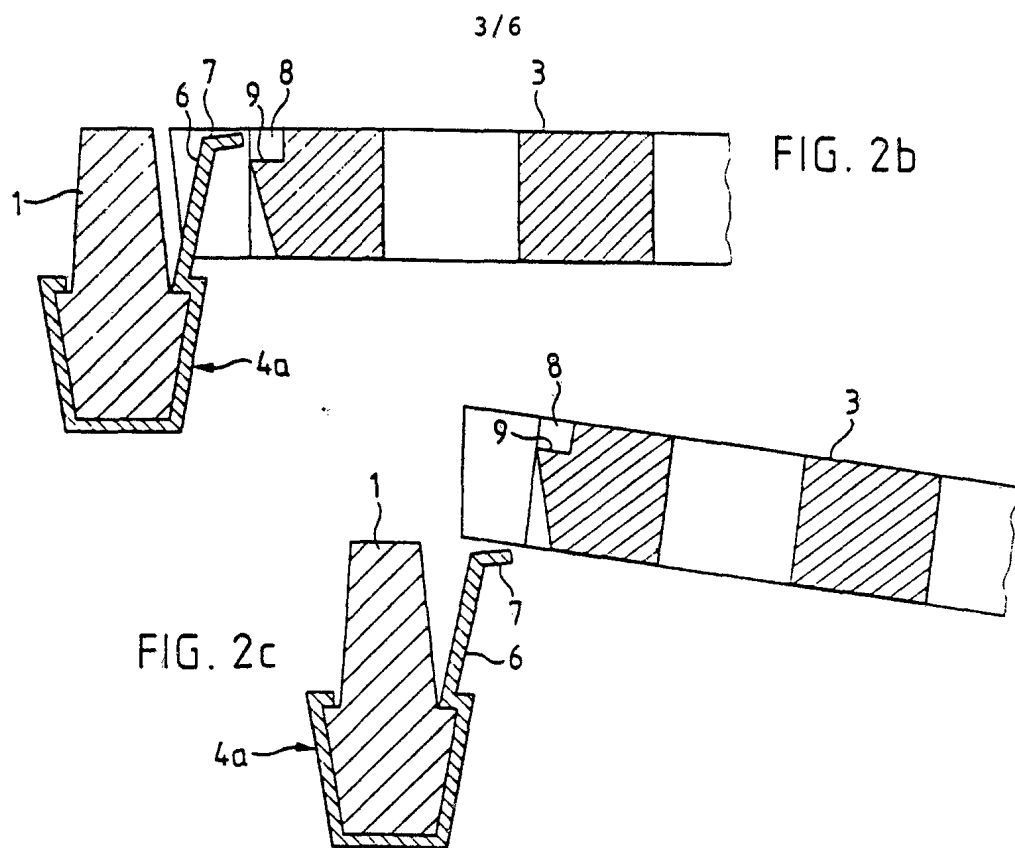


FIG. 2a



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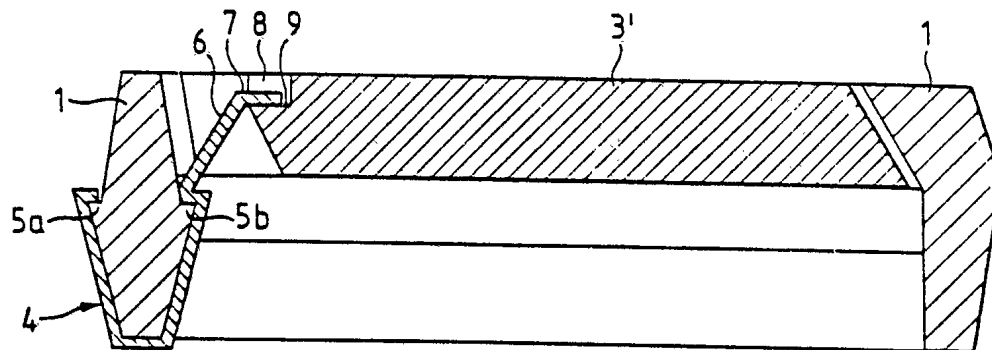


FIG. 4

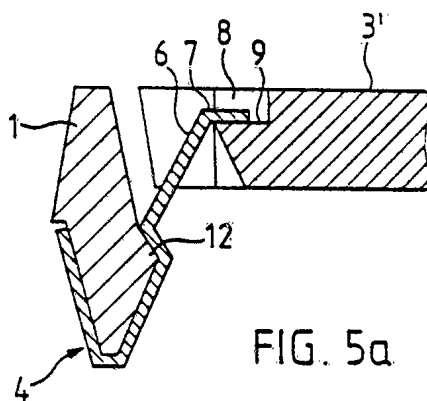


FIG. 5a

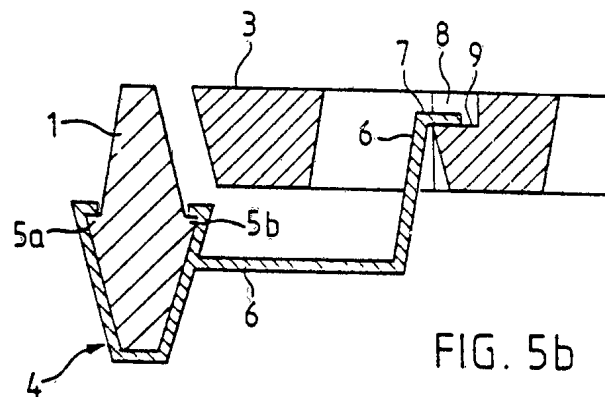


FIG. 5b

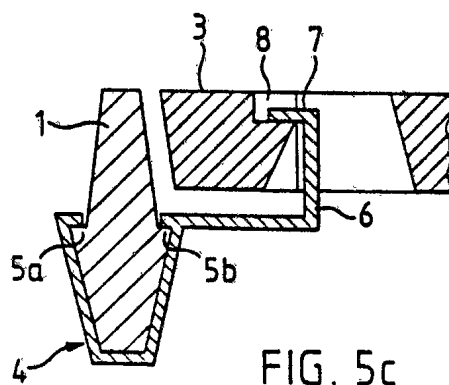


FIG. 5c

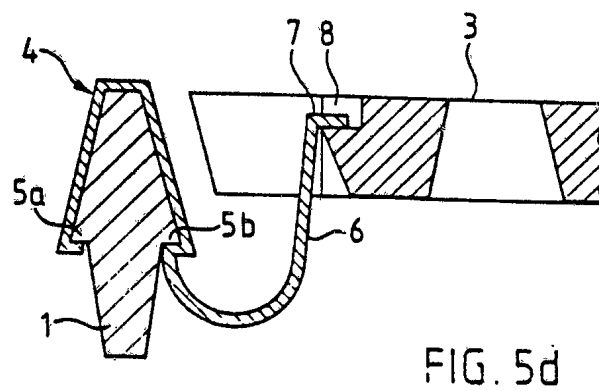


FIG. 5d

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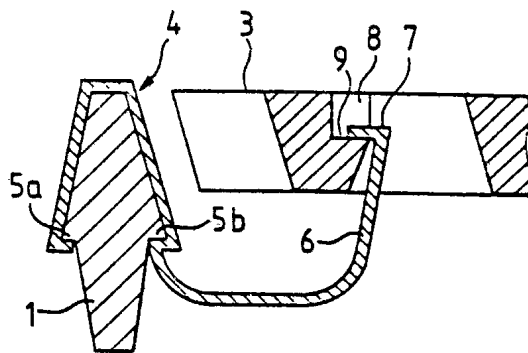


FIG. 5e

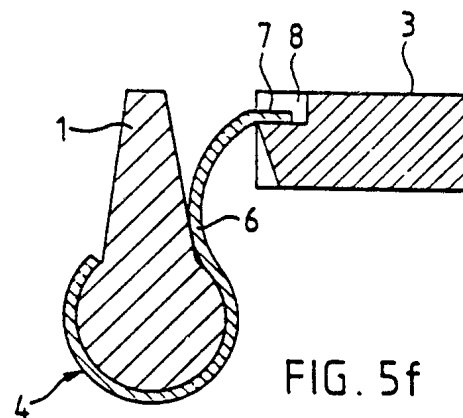


FIG. 5f

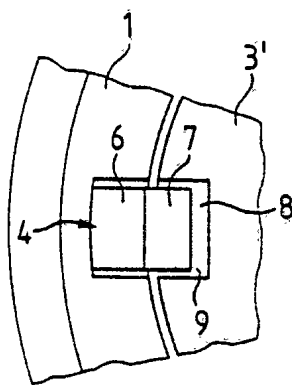


FIG. 6a

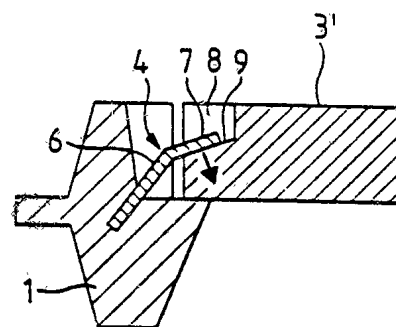


FIG. 6b

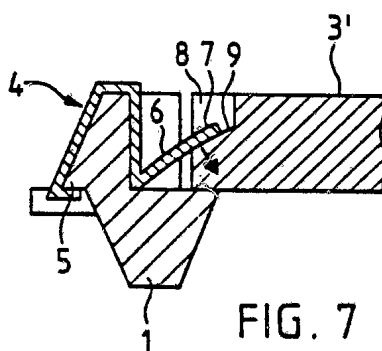


FIG. 7

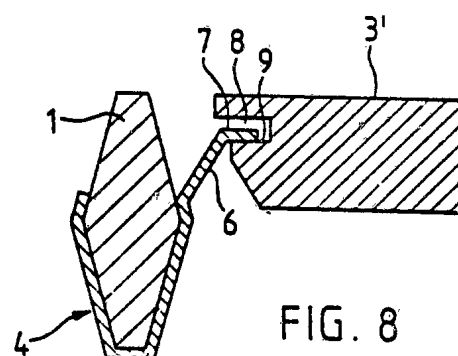
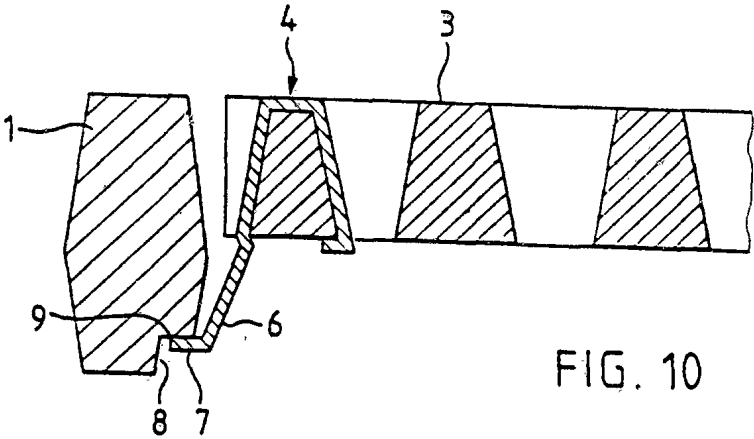
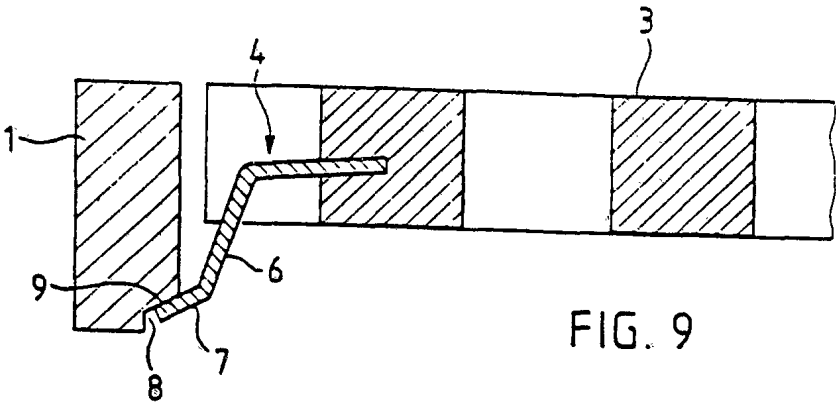


FIG. 8



INTERNATIONAL SEARCH REPORT

International Application No PCT/CH 90/00148

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) *	
According to International Patent Classification (IPC) or to both National Classification and IPC	
Int. Cl. ⁵ E 02 D 29/14, E 03 F 5/06	
II. FIELDS SEARCHED	
Minimum Documentation Searched ⁷	
Classification System ¹	Classification Symbols
Int. Cl. ⁵ E 02 D, E 03F, F 16 B, B 65 D	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *	
III. DOCUMENTS CONSIDERED TO BE RELEVANT *	
Category ⁸ :	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹² Relevant to Claim No. ¹³
X	FR, A, 2456169 (ETABLISSEMENTS MOREL) 5 December 1980 see page 2, line 11 - page 3, line 34; page 4, line 18 - page 7, line 4; page 7, lines 31-33; figures 1-5 1, 2
A	4, 10

A	SE, A, 445748 (UPONOR) 14 July 1986 see abstract 3, 6, 8-10

A	US, A, 2503222 (SIMONS) 4 April 1950 see column 1, lines 28-64; figures 1-4 3, 6-9

A	US, A, 1999113 (SHAPIRO) 23 April 1935 -----
* 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. "A" document member of the same patent family	
IV. CERTIFICATION	
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
10 September 1990 (10.09.90)	16 October 1990 (16.10.90)
International Searching Authority	Signature of Authorized Officer
European Patent Office	

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

CH 9000148

SA 37668

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 25/09/90
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A- 2456169	05-12-80	None	
SE-A- 445748	14-07-86	SE-A- 8301545	23-09-84
US-A- 2503222		None	
US-A- 1999113		None	

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen **PCT/CH 90/00148**

I. KLASSEFIZKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben) ⁶ Nach der internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC		
Int.Cl.⁵ E 02 D 29/14, E 03 F 5/06		
II. RECHERCHIERTE SACHGEBIETE		
Recherchierter Mindestprüfstoff ⁷		
Klassifikationssystem ¹	Klassifikationssymbole	
Int.Cl. ⁵	E 02 D, E 03 F, F 16 B, B 65 D	
Recherchierte nicht zum Mindestprüfstoff gehörende 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
X	FR, A, 2456169 (ETABLISSEMENTS MOREL) 5. Dezember 1980 siehe Seite 2, Zeile 11 - Seite 3, Zeile 34; Seite 4, Zeile 18 - Seite 7, Zeile 4; Seite 7, Zeilen 31-33; Figuren 1-5	1, 2
A	--	4, 10
A	SE, A, 445748 (UPONOR) 14. Juli 1986 siehe die Zusammenfassung	3, 6, 8-10
A	US, A, 2503222 (SIMONS) 4. April 1950 siehe Spalte 1, Zeilen 28-64; Figuren 1-4	3, 6-9
A	US, A, 1999113 (SILVER) 23. April 1939 -----	
[*] 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 der der Erfindung zugrundeliegenden Prinzipien 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
10. September 1990		16. 10. 90
Internationale Recherchenbehörde		Unterschrift des bevollmächtigten Bediensteten
Europäisches Patentamt		 Natalie Weinberg

ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR.

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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 25/09/90

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- 2456169	05-12-80	Keine	
SE-A- 445748	14-07-86	SE-A- 8301545	23-09-84
US-A- 2503222		Keine	
US-A- 1999113		Keine	

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