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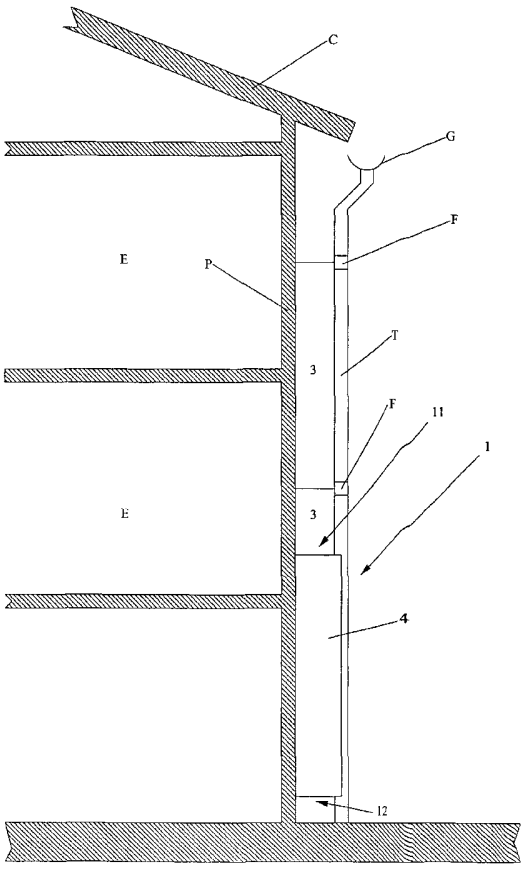
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(54) Title: ANTI-INTRUSION ELEMENT THAT CAN BE APPLIED TO DRAINAGE PIPES



(57) Abstract: The invention realises an anti-intrusion element (1, 100, 101, 102) which can be applied to a unit for collecting and running off rainwater of the type comprising one or more vertical drainage pipes (T) anchored on the outside along a wall (P) of a building (E) with which they define a vertical slit (3). The anti-intrusion element (1, 100, 101, 102) comprises a main body (4) with mainly longitudinal extension, capable of being placed between the drainage pipes (T) and the wall (P), to close the slit (3) and to prevent a grip for climbing up the building (E).

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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ANTI-INTRUSION ELEMENT THAT CAN BE APPLIED TO DRAINAGE PIPES.

The invention concerns an anti-intrusion element which can be applied to drainage pipes of units for running off rainwater collected on the roofs of buildings.

As is known, units for collecting and running off rain water are substantially made up of one or more gutters, arranged near to the roof of the building, hydraulically connected to a plurality of drainage pipes which convey the collected water to the ground.

More precisely, the drainage pipes consist of pipes going downwards which can be hidden in the thickness of the walls, in spaces intended for them, or else arranged on the outside along the walls of the building.

As is known, drainage pipes, be they outside or inside, must be arranged a minimum distance of a few centimetres from the walls to avoid both that wetness be transmitted to the masonry walls and to ease the aeration of the pipe, which prevents, or at least delays, possible corrosion processes of the pipe itself.

In particular outside drainage pipes are fixed to the walls through straps or bands substantially consisting of a metal ring equipped with a spacer stem.

The installation foresees that the stem be fixed to the wall of the building, for example through screws, and that then the ring be clamped onto the pipe.

This determines the presence of a vertical slit, defined by the wall of the building and by the surface of the drainage pipe facing it, which extends vertically on all of the wall of the building.

A first drawback of such units consists of the fact that the presence of such vertical slits allows a grip for climbing up the drainage pipe.

This thus allows a dishonest person to hold onto the drainage pipe to climb up the wall of the building and try to force the windows in order to access the inside of the building itself to carry out, for example, a burglary.

A purpose of the present invention is to overcome the aforementioned drawback.

In particular, a first purpose of the invention is to realise an anti-intrusion element which can be applied to drainage pipes which allows the degree of security against possible intruders in a building to be increased.

Another purpose is to realise an anti-intrusion element which can be applied to drainage pipes or to the wall in the installation step of the rainwater collection and discharge unit.

A further purpose is to realise an anti-intrusion element which can be applied to drainage pipes of units which are already installed.

Another purpose is to realise an element which can be applied to pre-existing units without needing to disassemble the unit and/or replace the drainage pipes.

The last but not least purpose is to realise an element which whilst still ensuring the necessary security requirements does not change the overall aesthetic shape of the drainage pipe and of the building.

Said purposes are accomplished by an anti-intrusion element which can be applied to a unit for collecting and running off rainwater of the type comprising one or more vertical drainage pipes anchored on the outside along a wall of a building with which they define a vertical slit which in accordance with the main claim is characterised in that it comprises a main body with mainly longitudinal extension, capable of being placed between said one or more drainage pipes and said wall, to close said vertical slit and prevent a grip for climbing up said building.

According to a preferred embodiment the main body is equipped with a longitudinal seat having a cross section matching the profile of the drainage pipes and a flat surface suitable for being placed in contact with the wall, joined together by two side surfaces.

The proposed anti-intrusion element advantageously also allows intervention on units which already exist, increasing their security, with relatively low costs without replacing the drainage pipes which are present.

Again advantageously the anti-intrusion element ensures the aeration of the drainage pipe and of the wall thanks to the presence of through holes made on the surfaces of the main body.

Said purposes and advantages shall become clearer during the description of some preferred embodiments given for indicating and not limiting purposes referring to the attached tables of drawings, where:

- figure 1 represents an overall view of the anti-intrusion element object of the present invention, installed in operation in a unit for collecting and running off rainwater of a building;
- figure 2 represents an axonometric view of the anti-intrusion element of figure 1 applied to a drainage pipe;
- figure 3 represents a cross section of the anti-intrusion element of figure 1;
- figure 4 represents a cross section of a first variant embodiment of the anti-

intrusion element of figure 1;

- figure 5 represents a cross section of another variant embodiment of the anti-intrusion element of figure 1;

- figure 6 represents a cross section of a further embodiment of the anti-intrusion element object of the invention;

The anti-intrusion element object of the present invention is represented in figure 1, where it is wholly indicated with 1, applied to a drainage pipe T of a unit for collecting and running off rainwater from a building E.

More specifically, the unit consists of a plurality of drainage pipes T hydraulically connected to a gutter G arranged near to the roof C of the building E.

The drainage pipes T are anchored on the outside along a wall P of the building and through bands F of the type described above and define with the wall itself P a vertical slit 3 which crosses the building E vertically.

The invention foresees that the anti-intrusion element comprises a main body 4 with mainly longitudinal extension, capable of being placed between the drainage pipes T and the outer wall P, which closes the vertical slit 3 to prevent a grip for climbing up the drainage pipes T.

More specifically, the main body 4 consists of a profile, shown in detail in figures 2 and 3, having a mixtilinear section, in which a longitudinal seat 5, a support surface 6 and two side surfaces 7, 8 are defined.

The longitudinal seat 5 has a cross section matching the profile of the drainage pipes T which in the represented case T have a section which is circular but it can be whatever shape.

The support surface 6 is substantially flat and is suitable for being placed in contact with the surface S of the outer wall P of the building.

As far as the side surfaces 7 and 8 are concerned, they are substantially flat and are suitable for being placed in contact, along their longitudinal edges 7a, 7b and 8a, 8b respectively with the surface S of the outer wall P and the outer surface of the drainage pipes T so as to define, between the wall P and the drainage pipe T, a substantially continuous surface.

This advantageously eliminates any possible slit which may function as a grip for climbing up the building E.

In the represented example the main body 4 consists of a hollow profile obtained by means of bending of a sheet element consisting of a sheet of copper.

Alternatively, the main body can be full and obtained by drawing or pressing of different materials, such as metals or plastics and more generally natural or synthetic materials.

It is important to also observe that the anti-intrusion element, since it is hollow, defines, between the wall P and the drainage pipe T, an aeration channel 10 open at the upper and lower end 11 and 12, as can be seen in figure 1, which ensures the necessary circulation of air to avoid wetness from being transmitted to the masonry walls and to avoid, or at least delay, possible corrosion processes of the pipe T itself.

To further increase such circulation the anti-intrusion element 1 is equipped with a plurality of through holes 13, which can be seen in figure 2, made on the surfaces of the profile 6 and along all of the seat 5.

A first variant embodiment represented in detail in figure 4 and wholly indicated with 100 differs from the previous one in that the profile has a substantially H-shaped cross section.

More specifically, the profile consists of two side surfaces 70, 80 connected together through a transversal rib 9 substantially arranged along the middle line which crosses each side surface 70, 80.

In such an embodiment the longitudinal seat 5 is defined, as highlighted with a broken line in the same figure, by the longitudinal edges 70b and 80b of the side surfaces 70, 80 whereas the support surface 6 is not present.

A further variant embodiment, represented in figure 5 and wholly indicated with 101, differs from the previous one in that the profile has a substantially C-shaped cross section.

More specifically, in such an embodiment the rib 91 is arranged at the longitudinal edges 71a and 81a of the side surface 71 and 81, and constitutes the support surface 6.

Another variant embodiment, represented in figure 6 and wholly indicated with 102, differs from the previous one in that the profile has a substantially U-shaped cross section.

More specifically, in such an embodiment the transversal rib 92 is arranged at the longitudinal edges 72b, 82b of the side surfaces 72, 82 which, as stated previously, are suitable for being placed in contact with the outer surface of the drainage pipes T.

The rib 92 also has a shaped profile matching the cross section of the drainage

pipe T which, in the represented case, is circular but it can be whatever shape.

It is important to observe that the side surfaces 7, 70, 71, 72 and 8, 80, 81, 82 can have a shaped profile and can be parallel to each other or, alternatively, they can diverge, like in the variants of figures 4, 5 and 6 so as to form, with the wall of the building, an acute angle.

The anti-intrusion element can, in some embodiments, be equipped with means for attaching to the wall P, not represented, for example consisting of tabs equipped with through holes suitable for receiving screws for locking to the wall P.

Alternatively, such locking means can consist of bands which can be anchored to the drainage pipes T.

The installation of the anti-intrusion element can advantageously be carried out both in new units and in pre-existing units without it being necessary to replace the drainage pipes T.

The ways of installing the anti-intrusion element object of the invention shall be described hereafter with reference to the embodiment represented in figures 2 and 3 without there being substantial differences with respect to the other embodiments described above.

Installation in new units foresees that the operator, before fixing the drainage pipes T to the walls through the straps described above, inserts the anti-intrusion element between the drainage pipe T and the outer wall P so that the support surface 6 lies upon the wall P and the seat 5 faces towards the drainage pipe T.

Then the operator tightens the band F locking the drainage pipe T in the desired position as represented in figures 1 and 3.

Application to pre-existing units foresees that the operator, having identified the portion where he wishes to install the anti-intrusion element, loosens the bands F of the drainage pipes T by so much as to slot the element itself between the wall P and the pipe T and then proceeds to attaching the bands.

It should be noted that, advantageously, the anti-intrusion element, when fixing is complete, is kept in the natural working position thanks to the friction created between the wall P and the drainage pipe T, in this way making superfluous its attachment to the wall or to the drainage pipe through the attachment means described above.

Advantageously, the anti-intrusion element can be fitted where desired and can have a longitudinal seat 5 with whatever section suitable for receiving, as

previously stated, drainage pipes with whatever section.

In particular, it can be arranged from the ground or at a man's height for a portion which is variable but in any case sufficient to prevent climbing up the building E.

A typical installation can foresee fitting the element from the ground up to a height of about 4 metres, so as to prevent access to the upper floors of the building.

Finally, it should be observed that the transversal sizes of the anti-intrusion element are less than or at most equal to the size of the diameter of the drainage pipe T. This makes the element totally unnoticeable and thus such as not to affect the overall aesthetic look of the building.

Although the invention has been described with reference to the attached tables of drawings, it can undergo modifications in embodiment step, all of which are covered by the inventive concept itself expressed by the claims shown hereafter and therefore protected by the present patent.

CLAIMS

1) Anti-intrusion element (1, 100, 101, 102) which can be applied to a unit for collecting and running off rainwater of the type comprising one or more vertical drainage pipes (T) anchored on the outside along a wall (P) of a building (E) with which they define a vertical slit (3) **characterised in that** it comprises un main body (4) with mainly longitudinal extension, capable of being placed between said one or more drainage pipes (T) and said wall (P), to close said vertical slit (3) and to prevent a grip for climbing up said building (E).

2) Element (1, 100, 101, 102) according to claim 1) **characterised in that** said main body (4) is equipped with at least two side surfaces (7, 70, 71, 72, 8, 80, 81, 82) suitable for being placed in contact along their longitudinal edges (7a, 7b and 8a, 8b) respectively with the surface (S) of said outer wall (P) and the outer surface of said one or more drainage pipes (T) so as to define a substantially continuous surface.

3) Element (1, 101) according to claim 1) or 2) **characterised in that** said main body (4) is equipped with a support surface (6) suitable for being placed in contact with said wall (P).

4) Element (1, 100, 101, 102) according to claim 1) or 2) or 3) **characterised in that** said main body (4) is equipped with a longitudinal seat (5) having a cross section matching the profile of said one or more drainage pipes (T).

5) Element (100) according to claim 2) **characterised in that** said main body (4) consists of a profile which has a substantially H-shaped cross section and comprises two side surfaces (70, 80) connected together through at least one transversal rib (9).

6) Element (101) according to claims 2) and 3) **characterised in that** said main body (4) consists of a profile which has a substantially C-shaped cross section and comprises two side surfaces (71, 81) connected together through at least one rib (91) which constitutes said support surface (6).

7) Element (102) according to claims 2) and 4) **characterised in that** said main body (4) consists of a profile which has a substantially U-shaped cross section and comprises two side surfaces (72, 82) connected together through at least one shaped transversal rib (92) having a profile matching the cross section of said one or more drainage pipes (T) which constitutes said longitudinal seat (5).

8) Element (1, 100, 101, 102) according to claim 5) or 6) or 7) **characterised in that** said profile is hollow.

9) Element (1, 100, 101, 102) according to claim 8) **characterised in that** said profile defines at least one open aeration channel (10) suitable for ensuring the circulation of air between said one or more drainage pipes (T) and said wall (P).

9) Element (1, 100, 101, 102) according to claim 8) **characterised in that** the surfaces (5, 6) of said profile have through holes (13) communicating with said at least one aeration channel (10) suitable for increasing said aeration.

10) Element (1, 100, 101, 102) according to any one of claims 5) to 9) **characterised in that** said profile is obtained by means of bending of a sheet element.

11) Element (1, 100, 101, 102) according to any one of claims 5) to 9) **characterised in that** said profile is obtained by drawing.

12) Element (1, 100, 101, 102) according to any one of claims 2) to 11) **characterised in that** said side surfaces (7, 70, 71, 72, 8, 80, 81, 82) are substantially flat.

13) Element (1, 100, 101, 102) according to any one of claims 2) to 11) **characterised in that** said side surfaces (7, 70, 71, 72, 8, 80, 81, 82) are shaped.

14) Element (1, 100, 101, 102) according to any one of the previous claims **characterised in that** it is equipped with means for attaching to said wall (P) and/or to said one or more drainage pipes (T).

15) Element (1, 100, 101, 102) according to claim 14) **characterised in that** said attachment means are tabs equipped with through holes suitable for receiving locking screws.

16) Element (1, 100, 101, 102) according to claim 14) **characterised in that** said means for attaching to said one or more drainage pipes (T) are bands.

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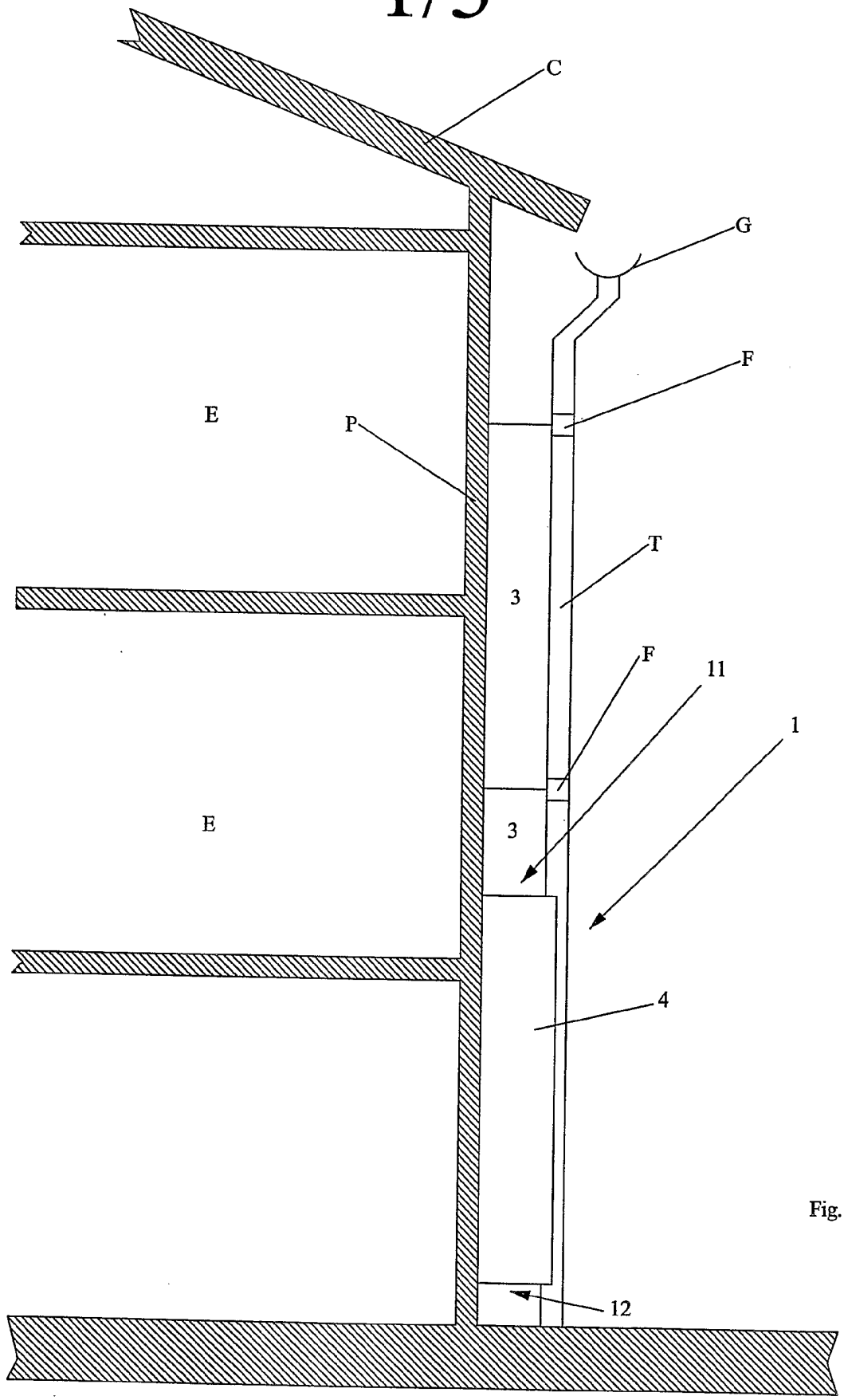


Fig.1

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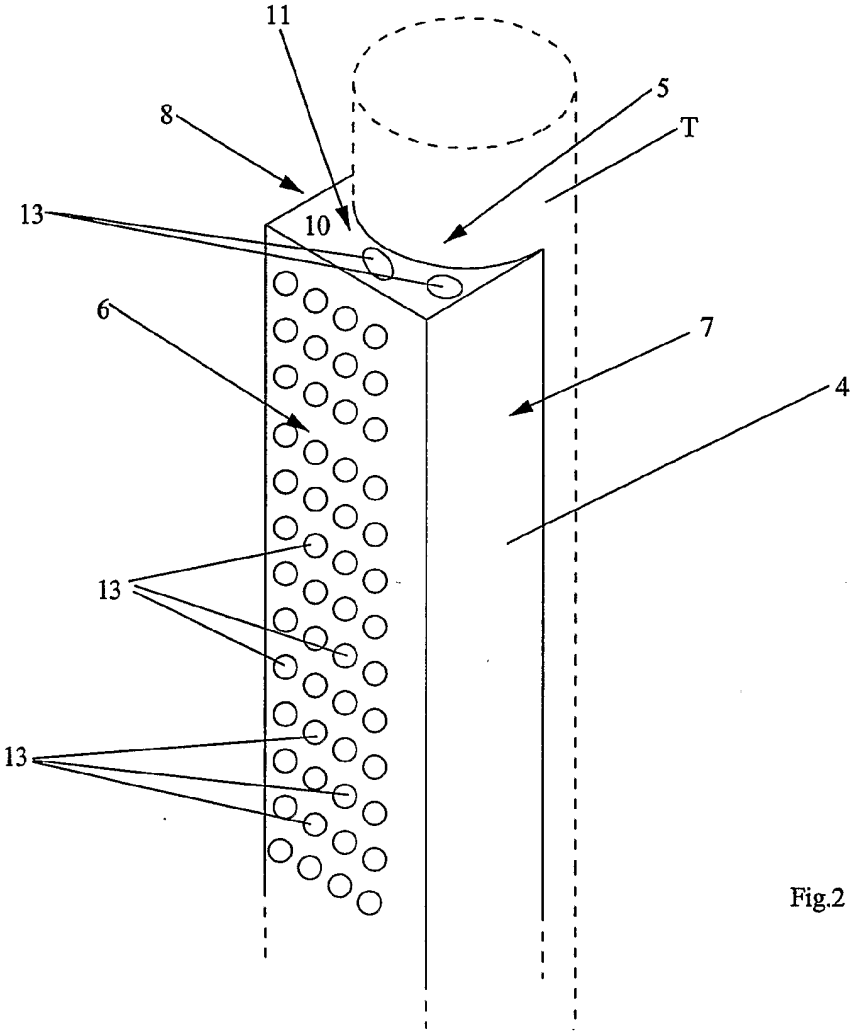


Fig.2

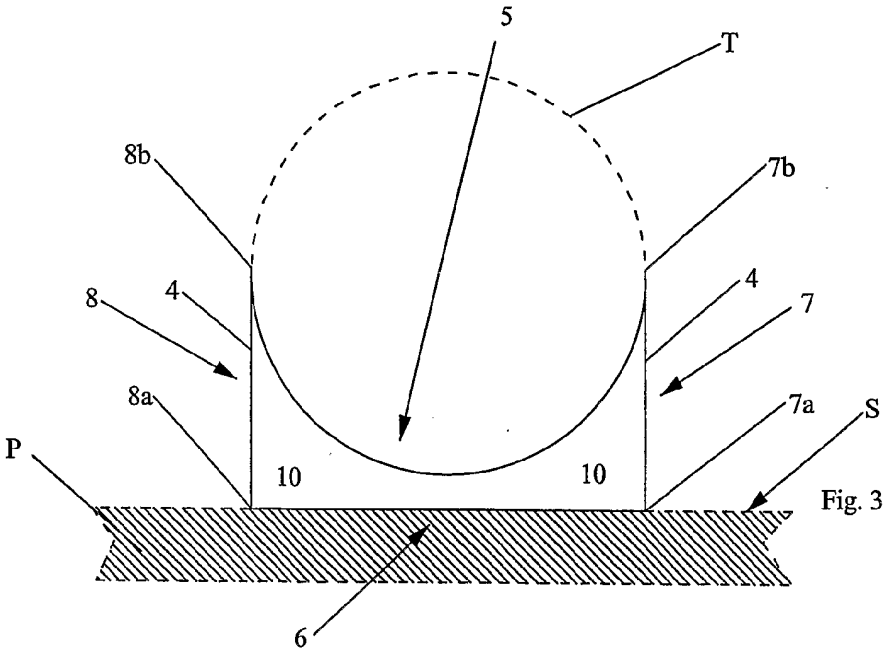


Fig. 3

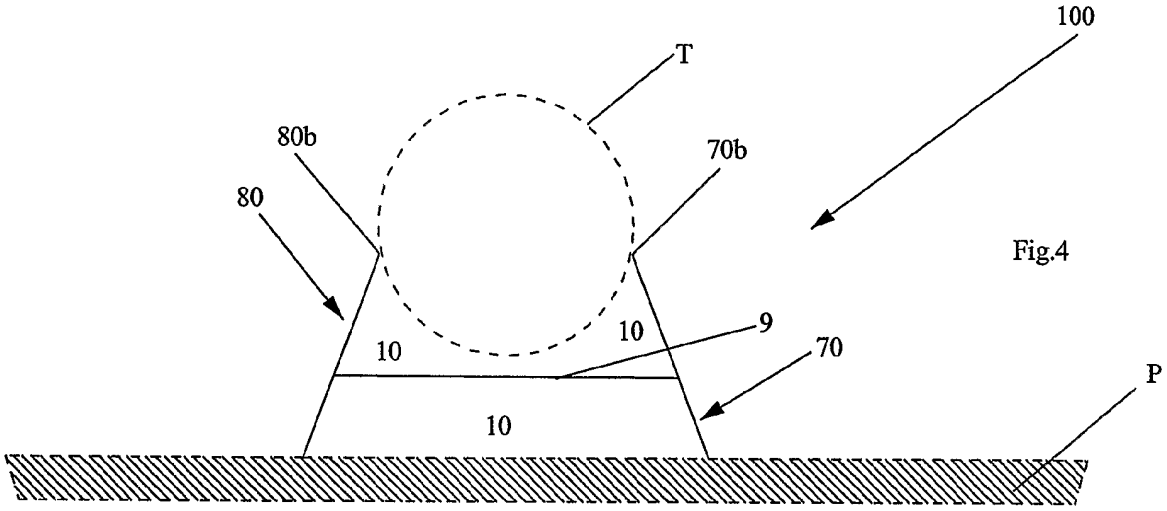


Fig.4

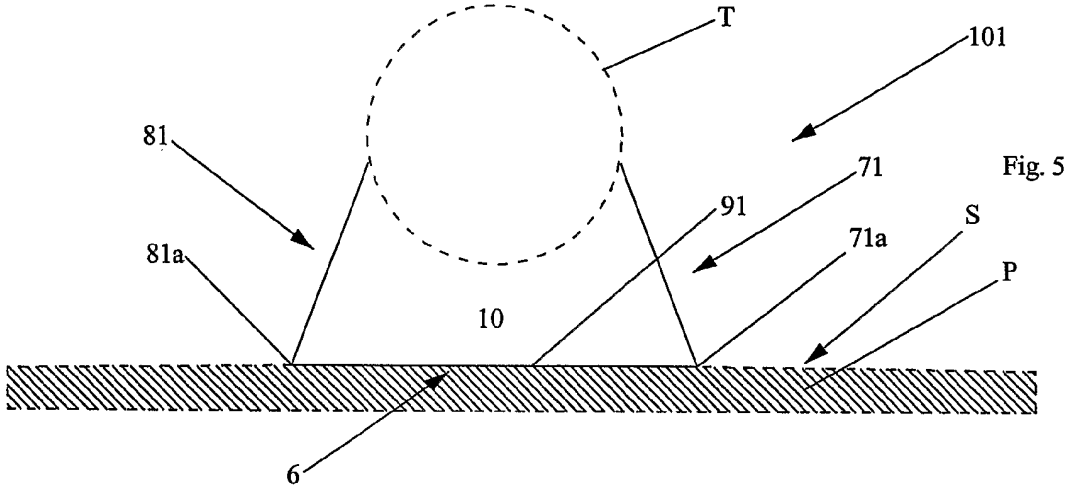


Fig. 5

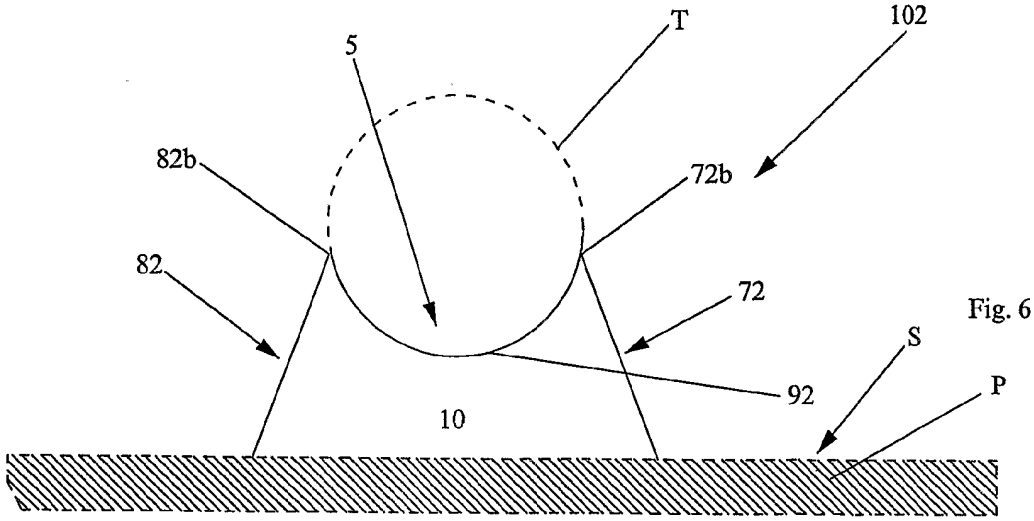


Fig. 6

INTERNATIONAL SEARCH REPORT

PCT/IT 03/00082

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E04D13/08

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 7 E04D

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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A Y	GB 269 073 A (OVENDEN) 14 April 1927 (1927-04-14) page 2, line 16 -page 3, line 16; figures 4-6	1,3,12, 14,15 2,4-11, 13 16
A	GB 502 541 A (COOPER ET AL.) 20 March 1939 (1939-03-20) the whole document	1-3, 6-10, 12-15
A	DE 200 20 924 U (RHEINZINK GMBH) 15 March 2001 (2001-03-15) abstract; figures	1-3,6,8, 9,13-15
Y A	WO 98 27293 A (LINDAB AB) 25 June 1998 (1998-06-25) abstract; figures	16 1,7

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

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

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

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 June 2003	03/07/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Righetti, R

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

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