

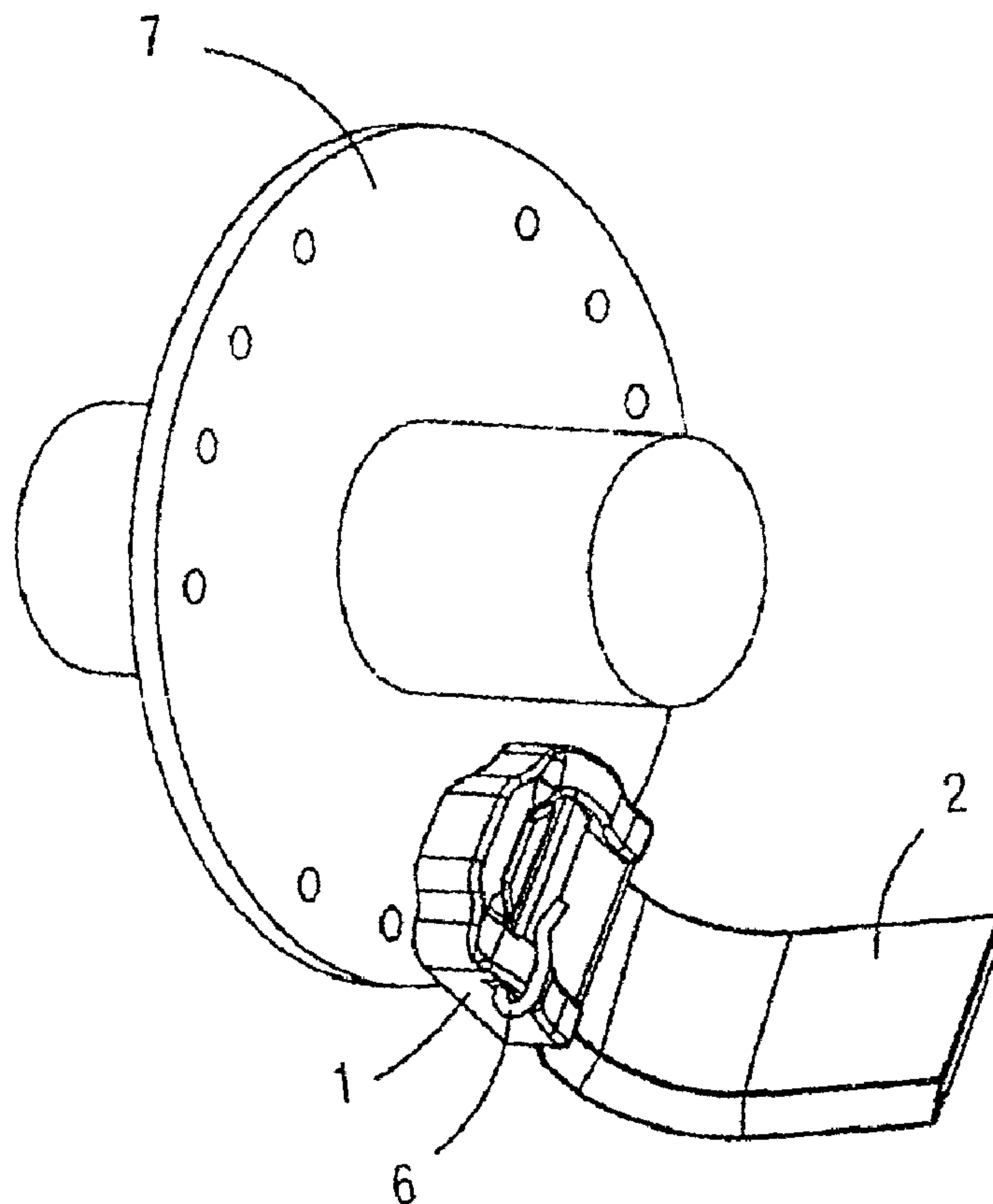


(86) Date de dépôt PCT/PCT Filing Date: 2008/06/05
(87) Date publication PCT/PCT Publication Date: 2008/12/18
(45) Date de délivrance/Issue Date: 2011/11/08
(85) Entrée phase nationale/National Entry: 2009/12/11
(86) N° demande PCT/PCT Application No.: ES 2008/000411
(87) N° publication PCT/PCT Publication No.: 2008/152167
(30) Priorité/Priority: 2007/06/12 (ES P200701613)

(51) Cl.Int./Int.Cl. *A01B 33/14* (2006.01)
(72) Inventeur/Inventor:
ARNABAT CASTELLVI, CARLES, ES
(73) Propriétaire/Owner:
DIGGER TOOLS, S.L., ES
(74) Agent: ROBIC

(54) Titre : DISPOSITIF DE FIXATION POUR L'ACCOUPLEMENT DE DENTS A DES MACHINES DE CULTURE AGRICOLES

(54) Title: FASTENING DEVICE FOR COUPLING OF BLADES IN AGRICULTURAL CULTIVATION MACHINES



(57) Abrégé/Abstract:

Fastening device for coupling of blades in agricultural cultivation machines, in particular, tilling machines such as rotary tillers, characterized in that it comprises an intermediate fastening element (1), formed by a solid body, which joins the blade (2) to the

(57) Abrégé(suite)/Abstract(continued):

rotary plate (7); said intermediate fastening element (1) is equipped with fastening means (3) for linking same to the rotary plate (7); guiding means (4) for insertion of the blade (2) into the intermediate fastening element (1); and at least one through hole (5), extending transversely with respect to the direction of the guiding means (4) and intended for insertion of an extractable bolt (6) which, when said bolt (6) is inserted, acts as a retaining element for the blade (2) with respect to the intermediate fastening element (1). Said arrangement enables the user/operator to manually replace and/or reset the tilling blade, avoiding any need for accessory tools commonly used for this purpose.

(12) SOLICITUD INTERNACIONAL PUBLICADA EN VIRTUD DEL TRATADO DE COOPERACIÓN
EN MATERIA DE PATENTES (PCT)(19) Organización Mundial de la Propiedad
Intelectual
Oficina internacional(43) Fecha de publicación internacional
18 de Diciembre de 2008 (18.12.2008)

PCT

(10) Número de Publicación Internacional
WO 2008/152167 A1(51) Clasificación Internacional de Patentes:
A01B 33/14 (2006.01)(21) Número de la solicitud internacional:
PCT/ES2008/000411(22) Fecha de presentación internacional:
5 de Junio de 2008 (05.06.2008)

(25) Idioma de presentación: español

(26) Idioma de publicación: español

(30) Datos relativos a la prioridad:
P200701613 12 de Junio de 2007 (12.06.2007) ES(71) Solicitante (para todos los Estados designados salvo US):
DIGGER TOOLS, S.L. [ES/ES]; Pau Claris, 119, Pral.2,
E-08009 Barcelona (ES).

(72) Inventor; e

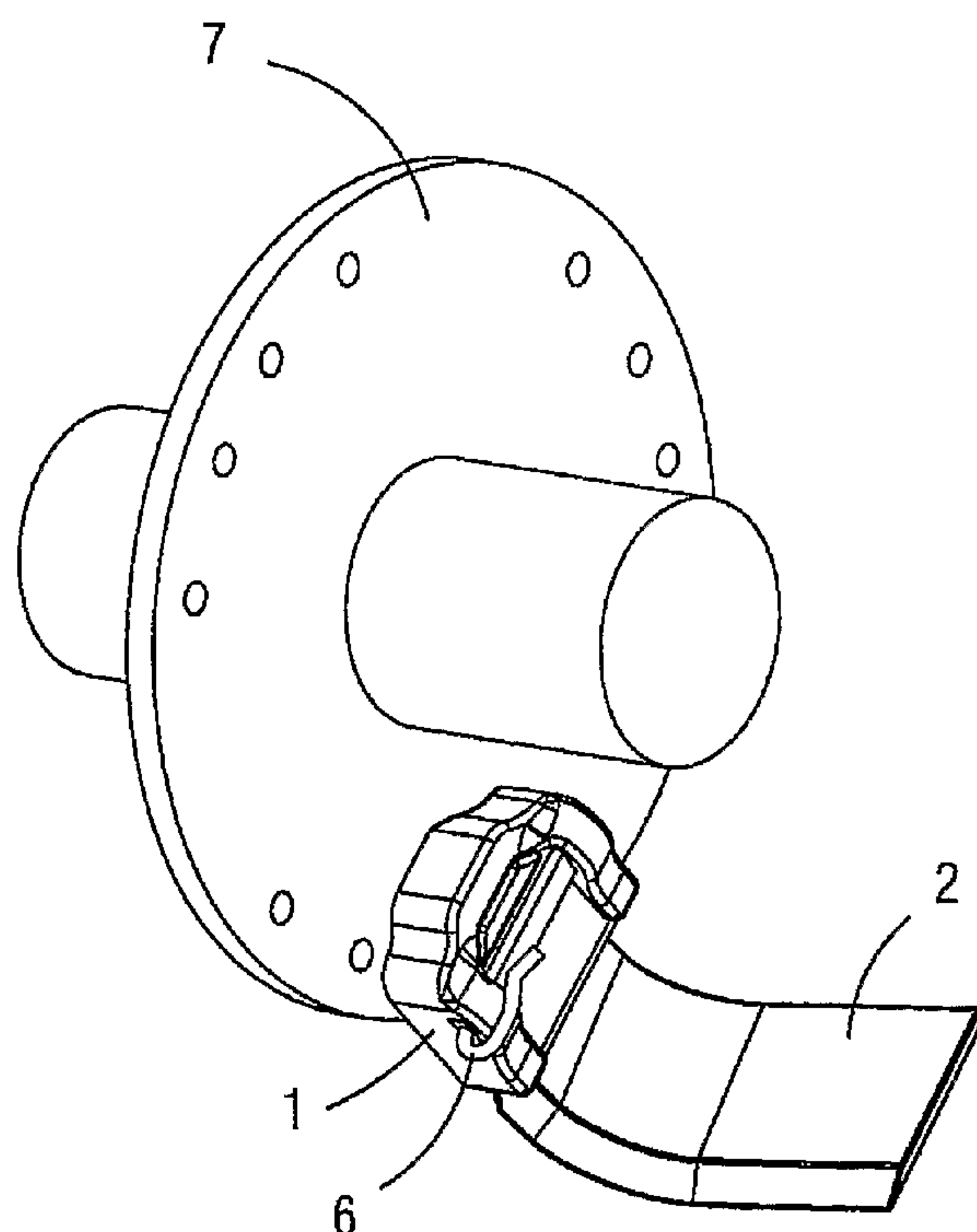
(75) Inventor/Solicitante (para US solamente): **ARNABAT
CASTELLVI, Carles** [ES/ES]; Pau Claris, 119, Pral.2,
E-08009 Barcelona (ES).(74) Mandatario: **ISERN JARA, Jorge**; Avda. Diagonal 463
bis 2º, E-08036 Barcelona (ES).(81) Estados designados (a menos que se indique otra cosa,
para toda clase de protección nacional admisible): AE,
AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR,
BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK,
DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM,
GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK,

[Continúa en la página siguiente]

(54) Title: FASTENING DEVICE FOR COUPLING OF BLADES IN AGRICULTURAL CULTIVATION MACHINES

(54) Título: DISPOSICIÓN DE FIJACIÓN PARA EL ACOPLAMIENTO DE CUCHILLAS EN MÁQUINAS DE CULTIVO
AGRÍCOLAS

Fig. 3

(57) Abstract: Fastening device for coupling of blades
in agricultural cultivation machines, in particular, tilling
machines such as rotary tillers, characterized in that it
comprises an intermediate fastening element (1), formed
by a solid body, which joins the blade (2) to the rotary plate
(7); said intermediate fastening element (1) is equipped with
fastening means (3) for linking same to the rotary plate (7);
guiding means (4) for insertion of the blade (2) into the
intermediate fastening element (1); and at least one through
hole (5), extending transversely with respect to the direction
of the guiding means (4) and intended for insertion of an
extractable bolt (6) which, when said bolt (6) is inserted,
acts as a retaining element for the blade (2) with respect to
the intermediate fastening element (1). Said arrangement
enables the user/operator to manually replace and/or reset
the tilling blade, avoiding any need for accessory tools
commonly used for this purpose.(57) Resumen: Disposición de fijación para el acoplamiento
de cuchillas en máquinas de cultivo agrícolas, en especial,
maquinas para la labranza tipo fresadoras o rotocultivadoras,
particularizada por comprender un elemento de fijación inter-
medio (1), formado por un cuerpo macizo, que une la cuchilla
(2) con el plato rotativo (7); estando provisto dicho elemento
de fijación intermedio (1) de unos medios de fijación (3) para
su vinculación al plato rotativo (7); de medios de guía (4) para
la inserción de la cuchilla (2) en el elemento de fijación inter-
medio (1); y de al menos un orificio (5) pasante transversal-
mente con respecto a la dirección de los medios de guía (4),
destinado a la inserción de un pasador (6) extraíble que, en
una posición de inserción de dicho pasador

[Continúa en la página siguiente]

WO 2008/152167 A1

WO 2008/152167 A1



SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US,
UZ, VC, VN, ZA, ZM, ZW.

MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF,
BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
TD, TG).

(84) Estados designados (*a menos que se indique otra cosa,
para toda clase de protección regional admisible*): ARIPO
(BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ,
UG, ZM, ZW), euroasiática (AM, AZ, BY, KG, KZ, MD,
RU, TJ, TM), europea (AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,

Publicada:

- *con informe de búsqueda internacional*
- *antes de la expiración del plazo para modificar las reivin-
dicaciones y para ser republicada si se reciben modifica-
ciones*

(6), actúa como elemento de retención de la cuchilla (2) respecto al elemento de fijación intermedio (1). La citada disposición permite el intercambio y/o reposición de la cuchilla de labranza con la simple actuación manual del usuario-operario, descartándose el uso de herramientas accesorias empleadas comúnmente para este fin.

- 1 -

FASTENING DEVICE FOR COUPLING OF BLADES IN AGRICULTURAL
CULTIVATION MACHINES

SPECIFICATION

AIM OF THE INVENTION

5 The aim of this Patent of Invention application is the registration of a fastening device for coupling of blades in agricultural cultivation machines, particularly, milling or tilling type cultivation machines, which includes important innovative elements and advantages over current fastening device arrangements used for the same purpose.

10 More specifically, the device of the invention allows the user-operator to changeover and/or replace the cultivation blade through a simple manual action, without using accessory tools such as specific wrenches, hammers, etc., commonly used for this purpose.

BACKGROUND TO THE INVENTION

15 At present, agricultural cultivation machines, particularly milling and tilling type cultivation machines, comprise a frame provided with a plurality of rotary plates on which blades are attached or linked.

 Particularly, the cutting movement of said blades is rotary since the blades are arranged on the diameter of a rotary plate that
20 is integral with a transmission shaft of said rotary movement.

 It is known that said blades are linked to the rotary plates by means of common screws, which implies using auxiliary tools for changing or replacing the blades, or, screws with special properties that are particularly designed for this function, and which require a specific type
25 of tool for handling.

 The fastening device for coupling of blades in agricultural cultivation machines, which is the object of this invention, resolves the previously mentioned drawbacks, and also provides other additional advantages that will become evident from the following attached
30 description.

- 2 -

The device of the invention is particularly designed for milling or tiller type cultivation machines, wherein the blades are linked on a rotary plate that is part of the actual machine in question. In particular, the cutting movement of said blades is rotary as they are arranged on the diameter of a rotary plate that is integral to a transmission shaft of said rotary movement.

To this end, and more specifically, said arrangement is characterized by the fact that it comprises an intermediate fastening element, made up of a solid body, which links the blade to the rotary plate; with said intermediate fastening element being provided with fastening means for linking it to the rotary plate; guiding means for inserting the blade in the intermediate fastening element; and at least one through hole transverse to the direction of the guiding means, intended for inserting a removable pin which, in an inserted position of said pin, acts like a retention element for the blade with respect to the intermediate fastening element.

According to the characteristics mentioned, the guiding means for inserting the blade consist of at least two opposite grooves arranged partially along the perimeter on the contact face of the solid body with the blade. This way the blade remains inserted inside the guiding means, except for the attacking area or area used for tilling.

Based on the characteristics described, the fastening means of the intermediate attachment element to the rotary plate consist of at least one bore hole for inserting a fastening screw that links the intermediate fastening element to the rotary plate.

Advantageously, and by virtue of the particular characteristics of the described invention, a device is obtained which makes it possible to change the tilling blade manually, without using auxiliary tools (wrenches, hammers, etc.).

It allows for the changeover or replacement of said blade owing to wear or breakage thereof by simply acting manually on the pin that acts as a retaining element.

- 3 -

In order to complete the following description, and to facilitate the comprehension of the characteristics thereof, a sheet of drawings accompanies this specification, which are an illustrative, non-limiting example of the most relevant details of the invention.

5 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 corresponds to a perspective view of the intermediate fastening element according to the characteristics of the invention;

10 Figure 2 corresponds to a perspective view of the pin of the invention; and

Figure 3 corresponds to a perspective view of the intermediate fastening element shown in the first figure in a working position on the rotary plate.

DESCRIPTION OF A PREFERRED EMBODIMENT

15 The mentioned figures and numbering show a preferred but not exclusive embodiment of the invention, which consists of a fastening device for coupling of blades in agricultural cultivation machines, particularly, milling and tilling type cultivation machines.

20 In particular, the blades are mounted on the diameter of a rotary plate, and hence the blades have a rotary cutting movement, with said plate being integral with a transmission shaft of said rotary movement.

As shown in Figures 1, 2 and 3, the invention arrangement is characterized in that it comprises an intermediate fastening element (1), made up of a solid body, which links blade (2) to rotary plate (7); with said intermediate fastening element (1) being provided with fastening means (3) for linking it to rotary plate (7); guiding means (4) for inserting blade (2) into intermediate fastening element (1); and at least one through hole (5) transverse to the direction of guiding means (4), for inserting a removable pin (6) which, in an insertion position of said pin (6), acts as a retention element for blade (2) with respect to intermediate fastening element (1).

30 According to the characteristics mentioned, and in the particular embodiment described, guiding means (4) for inserting blade (2)

- 4 -

consist of at least two opposite grooves arranged partially along the perimeter on the contact face of the solid body with blade (2).

According to another aspect of the invention, fastening means (3) of intermediate fastening element (1) to rotary plate (7) consist
5 of at least one bore hole for inserting a fastening screw that links intermediate fastening element (1) to the rotary plate.

Advantageously, and by virtue of the particular characteristics of the invention described, a device is obtained that makes it possible to changeover or replace the blade, owing to either wear or
10 breakage, by simply acting manually on the pin that acts as a retention element.

The details, shapes, dimensions and other accessory elements, as well as the materials used to manufacture the fastening device for coupling of blades in agricultural cultivation machines of the
15 invention, could be conveniently replaced by other technically equivalent elements without departing from the nature of the invention or the scope defined by the claims attached below.

- 5 -

CLAIMS

1. Fastening device for coupling of blades in agricultural cultivation machines, particularly, milling or tiller type cultivation machines, wherein the blades are linked on a rotary plate integral to the cultivation machine, characterized in that it comprises an intermediate fastening element (1), made up of a solid body, which attaches blade (2) to rotary plate (7); with said intermediate fastening element (1) being provided with fastening means (3) for attaching it to rotary plate (7); guiding means (4) for inserting blade (2) into intermediate fastening element (1); and at least one through hole (5) transverse to the direction of guiding means (4), intended for inserting a removable pin (6) which, in an insertion position of said pin, acts as a retention element for blade (2) with respect to intermediate fastening element (1).

2. Fastening device for coupling of blades in agricultural cultivation machines, according to claim 1, characterized in that guiding means (4) for inserting blade (2) consist of at least two opposite grooves arranged partially along a perimeter on a contact face of the solid body with blade (2).

3. Fastening device for coupling of blades in agricultural cultivation machines, according to claim 1, characterized in that fastening means (3) of intermediate fastening element (1) to rotary plate (7) consist of at least one bore hole for inserting a fastening screw that connects the intermediate fastening element (1) to rotary plate (7).

- 6 -

Fig. 1

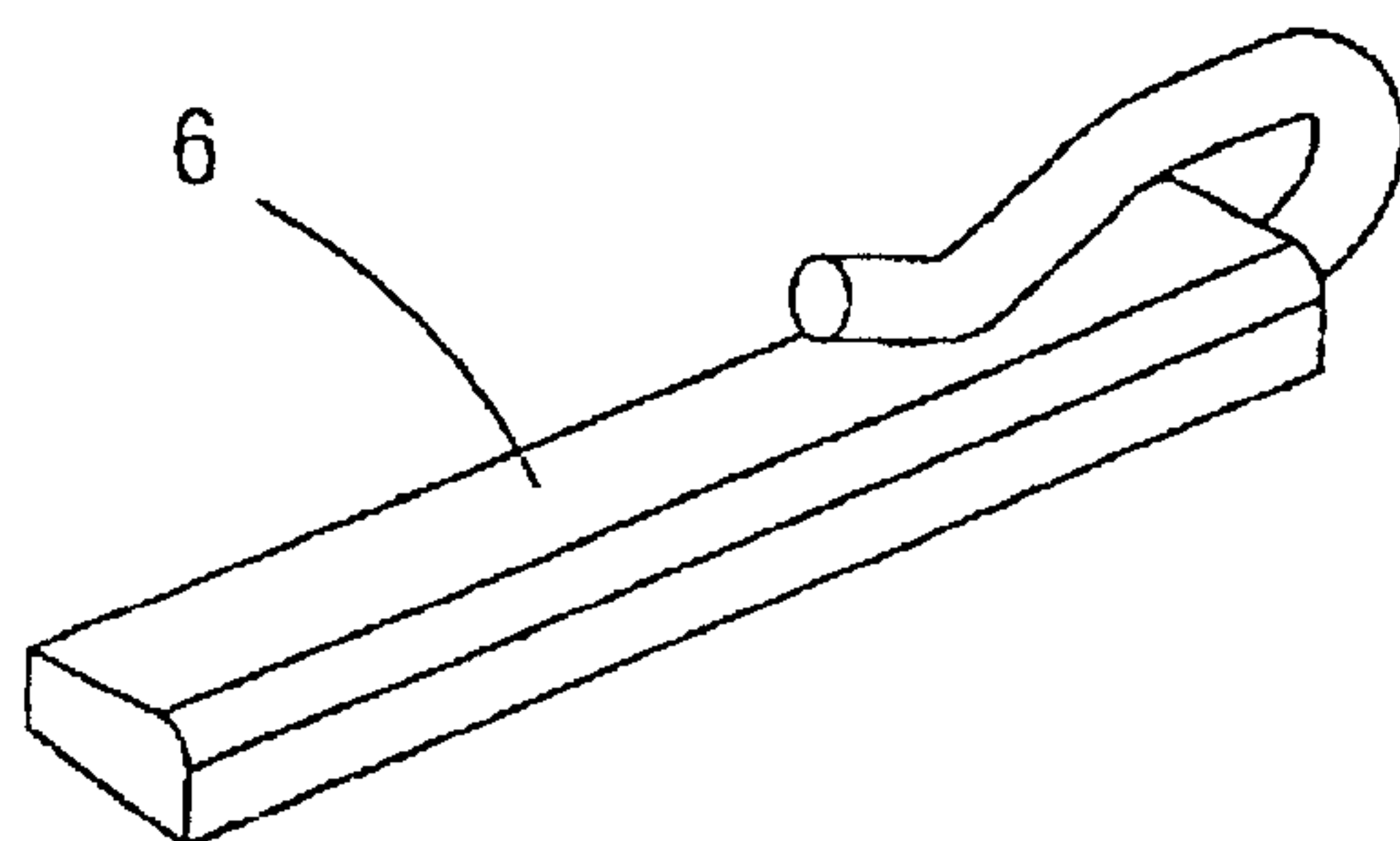
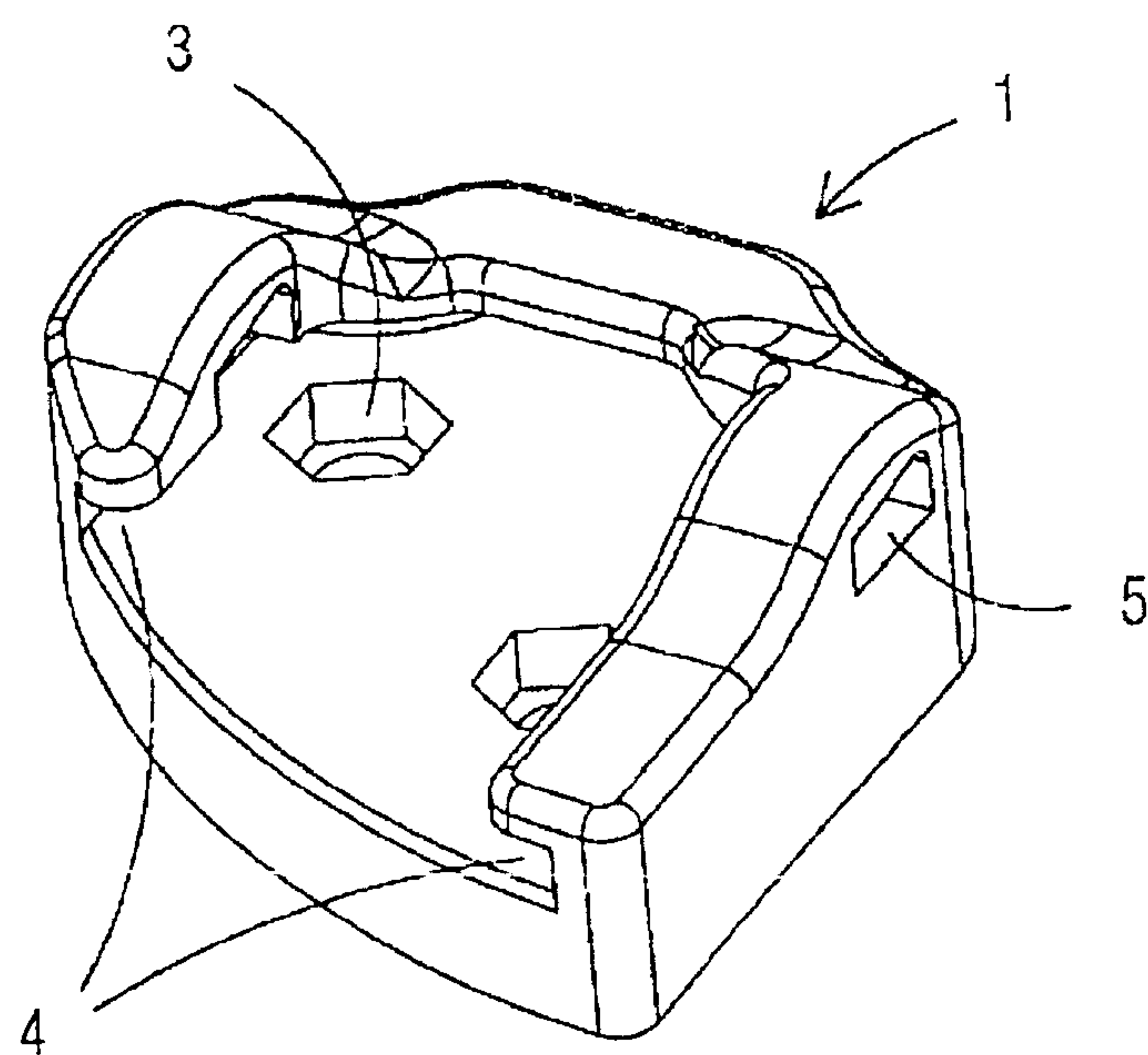


Fig. 2

- 7 -

Fig. 3

