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(54) Composite tooth for earthmovers.

(57) The invention relates to a composite tooth for earthmovers formed from a crown holder (10) having an end sung (13) with at least two diverging sloped shoulders on its sides, from a crown (11) with a cavity which has a bottom of a complimentary shape to that of the sung end to the sloped shoulders of the crown holder so that they can connect and from an elastic assembly key (12) which fits in oval holes transversally formed in the crown and crown holder.

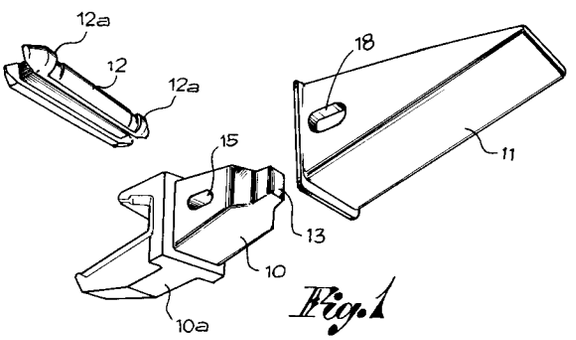

Fig.1

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The present invention relates to earthmovers such as excavators, shovels and the like, and more particularly to a composite tooth formed from a crown and crown holder for such machines.

Earthmovers having composite teeth formed from a crown and crown holder are already known. Whilst the crown holder is fixed to the so called blade of said machines, the crown is moveably fitted to the crown holder. In practice, the crown functions as a protective element so as to safeguard the crown holder or tooth from wear and is interchangeable without having to also disassemble and substitute the crown holder or tooth. Maintenance is therefore simplified as well as reducing time and cost.

The crown is usually chocked onto the crown holder or tooth and is fixed through a pin or key, the crown holder having a wedge-shaped part which connects to an appropriately shaped cavity formed in the crown. However, all the methods for coupling crowns and crown holders or teeth available at present are not able to exclude certain movements of the crown on and in respect to the crown holder which inevitably lead to its wearing. This therefore alters the coupling conditions and renders the crown holder unsuitable for holding a new crown correctly. Other fixing methods ensure a rigid blocking of the crown to the crown holder but do not permit an easy disassembly. So, the extraction of the fixing means is infact full of problems and difficult thus preventing a simple substitution of the crown.

The object of the present invention is to eliminate these problems and inconveniences through a new way of coupling and fixing the crown to the crown holder or tooth designed to prevent undue movements of the crown, to minimize the wearing of the surfaces which touch the two elements and to automatically recuperate space both in the coupling and clearance resulting in the minimum wear which can take place.

To this end the composite tooth here proposed made from a crown and crown holder is characterized in that:

- the crown holder has an end which is tapered so as to form a snug that has at least two sloped shoulders on its sides which diverge from the snug,
- the crown has a cavity with the bottom shaped so as to be complimentary to the sung and to the sloping shoulders form of the crown holder so that they can be connected,
- the crown and the crown holder each have a transversal hole which are of an oval section in the direction of the coupling of the two elements,
- the holes of the crown and crown holder align to each other following the coupling of the two elements and an elastic assembly key fits into said holes so as to ensure and constantly recuperate the contact of the sloped shoulders of the crown with those of the crown holder.

An example of the invention will follow with a detailed description and reference being made to the attached drawings in which:

Fig. 1	is a prospective view of the separate elements of a composite tooth;
Fig. 2	is a plan view in a partial section of the crown holder;
Figs. 3 and 4	are two longitudinal sections of the crown at a right angle; and
Figs. 5 and 6	show the composite tooth assembled according to two longitudinal sections formed at a right angle.

Fig. 1 therefore represents the crown holder (10), the crown (11) and the elastic key (12) designed to form a composite tooth which is to be applied to the blade of earthmovers.

The crown holder (10) can have an attachment shank (10a) being of any configuration according to the type and model of the machine to which the tooth is to be fitted. The crown (11) can also vary in shape depending on its destination.

In accordance with the invention, the free end of the crown holder (10) is tapered (Fig. 1 and 2) so as to form a snug (13) whose sides have at least two sloped shoulders (14) which diverge from each other starting from the snug (13) each at an angle which can vary within a wide range, for example from 20 to 60°, but preferably at about 45°. The crown holder (10) also has a transversal through hole (15) being of a general oval section in the direction of the length of the element, in other words in the direction of its coupling to the crown. Said hole (15) is in an intermediate position between the shoulders (14) and the attachment shank (10a) and can be of an elliptic shape or also formed from two holes of different intersection diametres.

The crown (11) has a cavity (11a) designed to receive the crown holder (10) obviously less the attachment shank (10a).

Such a cavity (11a) of the crown (11) (Figs. 3 and 4) has the same shape of the crown holder (10) and more precisely a recess (16) is formed on the bottom of said cavity having two slopes (17) on its sides. Said slopes diverge from the recess (16) towards the cavity opening. The bottom recess (16) is of such a shape and size so as to hold the snug (13) of the crown holder (10), whilst the slopes (17) are placed and angled so as to match the shoulders (14). Even the crown (11) has a transversal through hole (18) with an oval section in a transver-

sal direction similar to the hole (15) of the crown holder (10), the transversal holes (15, 18) being aligned when the crown holder and crown are coupled.

The elastic key (12), which is already known, is contractible and expandable in a transveral direction. It has a head with a blocking lug (12a) on each of its opposite ends.

In practice the crown holder (10) is fixed to the blade of the desired machine and the crown (11) is chocked onto the crown holder and blocked through the loaded key. The coupling (Figs. 5 and 6) is secured by the key (12) which is prevented from accidentally withdrawing from the holes (15, 18) by its blocking lugs (12a) which rest against the sides of the crown holder and in such a way that the heads of the key are enclosed in the holes (18) of the crown. When the snug (13) is inserted into the bottom recess (16) (Figs. 5 and 6) it helps to prevent the lateral movements of the crown (11) on the crown holder. The preloaded elastic key (12) keeps the crown tightly chocked to the crown holder making the slopes (17) inside the crown continuously rest against the sloped shoulders (14) at the sides of the snug of the crown holder. Due to the oval-shaped holes (15, 18) the crown, which is constantly stressed by the elastic key, slightly slides towards the shank of the crown holder. Said elastic key tends to "pull" the crown on the crown holder therefore recuperating any clearance in the coupling and other causes of wear. The crown therefore always results as being correctly centred and chocked on the crown holder positively and constantly resting against the sloped shoulders (14). The stress to which the crown is subjected is then mainly unloaded on said sloped shoulders without engaging the key. The function of this key is therefore limited to maintain the assembly of the two elements and is easily extractable through the drift or other means, at any moment in order to change the crown.

Claims

1. A composite tooth for earthmovers made from a crown (11) and a crown holder (10), characterized in that;
   - the crown holder (10) has a tapered end so as to form a snug (13), the sides of which have at least two sloped shoulders (14) which diverge from the snug;
   - the crown (11) has a cavity (11a) with a bottom being of a complimentary shape (16, 17) to that of the snug and to the sloped shoulders of the crown holder so that they can be connected to each other;
   - the crown (11) and the crown holder (10) each have a transversal oval section hole (15,18) in the direction of the coupling of the two elements;
   - the transversal holes (15, 18) of the crown and crown holder align to each other after the coupling of the two elements and hold an elastic assembly key (12) which ensures and constantly recuperates the contact between the sloped shoulders of the crown with those of the crown holder.

2. A composite tooth in accordance to claim 1, characterized in that the crown (11) has a bottom recess (16) designed to hold the snug (13) of the crown holder and has two slopes (17) which diverge from said recess being designed to rest against the sloped shoulders (14) of the crown holder, the crown being pulled onto the crown holder by the elastic key.

3. A composite tooth in accordance to claims 1 and 2, characterized in that said transversal holes (15, 18) are of an elliptic section or formed from holes of different intersection diametres.

4. A composite tooth in accordance to preceding claims, characterized in that the elastic key is assembled in said hold through pressure or preloaded and each opposite end has a head with a blocking lug (12a), said blocking lug resting against the sides of the crown holder so that the heads of the key result in being locked into the holes of the crown.

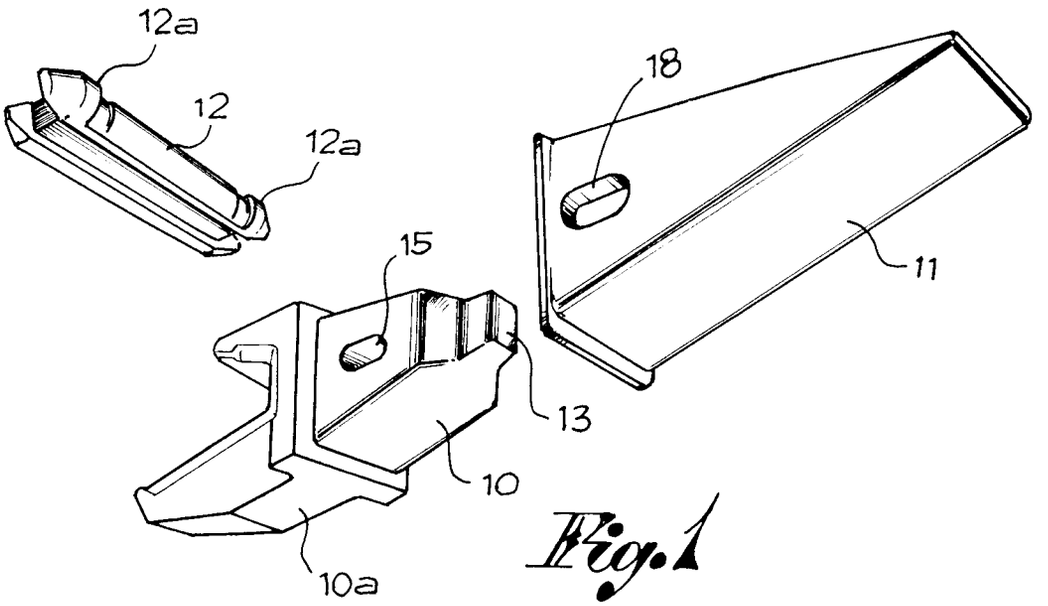

Fig. 1

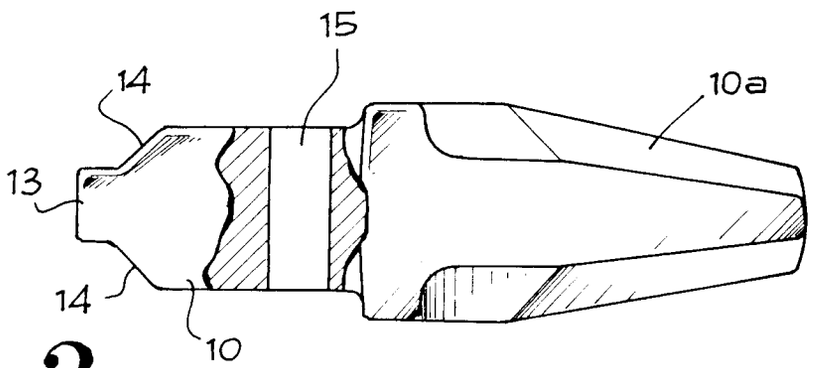

Fig. 2

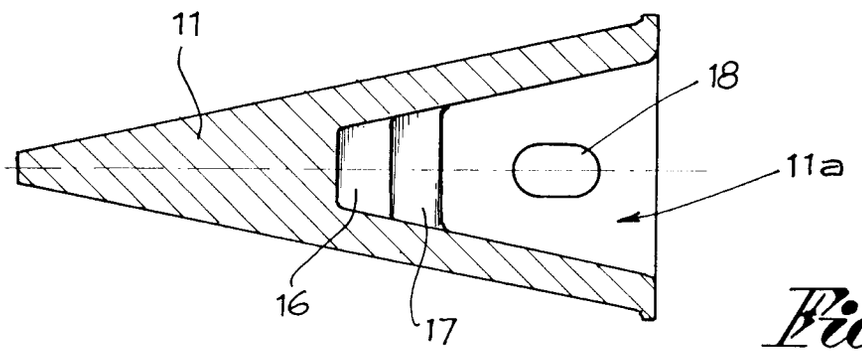

Fig. 3

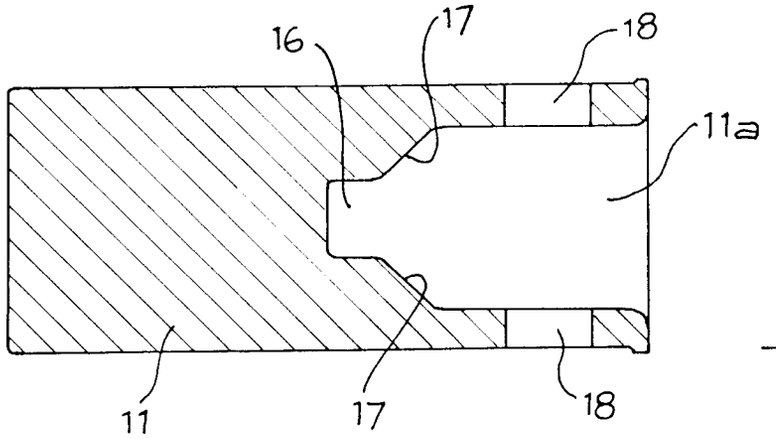

Fig.4

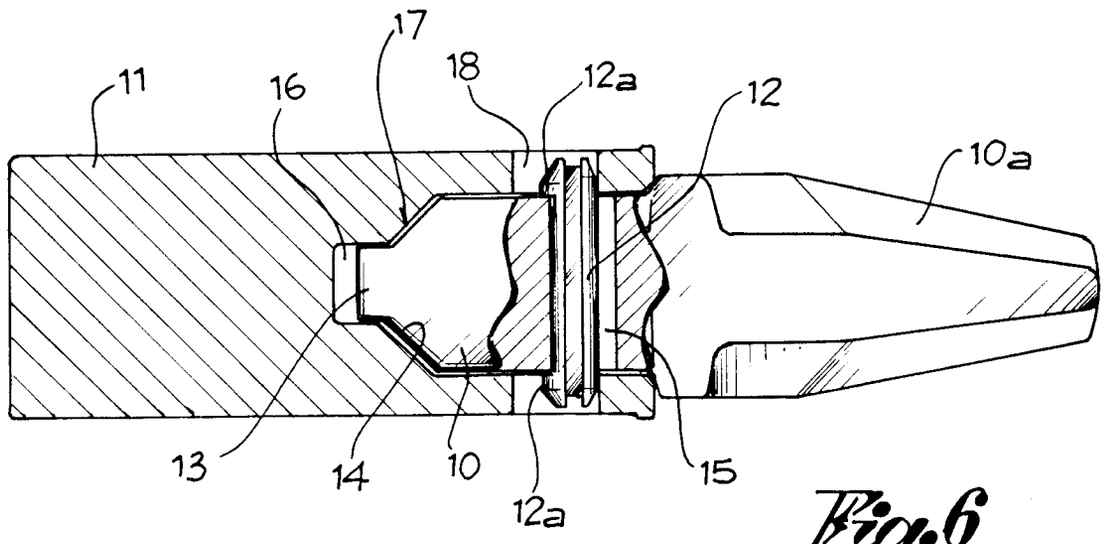

Fig.6

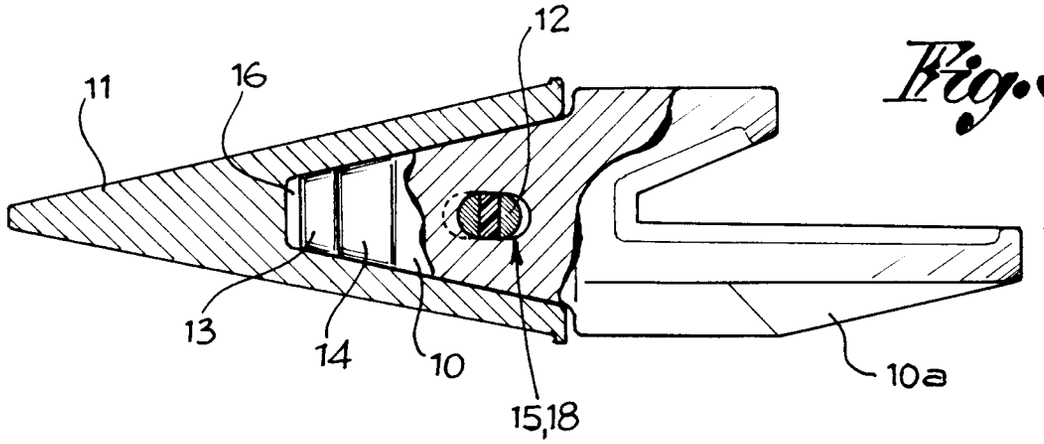

Fig.5

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EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0568

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 516 340 (LAUNDER) * abstract * * column 3, last paragraph * * column 4, line 1 - line 8 * * figures *	1-4	E02F9/28
A	WO-A-8 203 235 (CATERPILLAR TRACTOR CO.) * abstract * * page 4, paragraph 1 * * figures *	1,2,4	
A	FR-A-2 204 741 (POCLAIN) * figures *	1,2,4	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E02F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 JULY 1992	ESTRELA Y CALPE J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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