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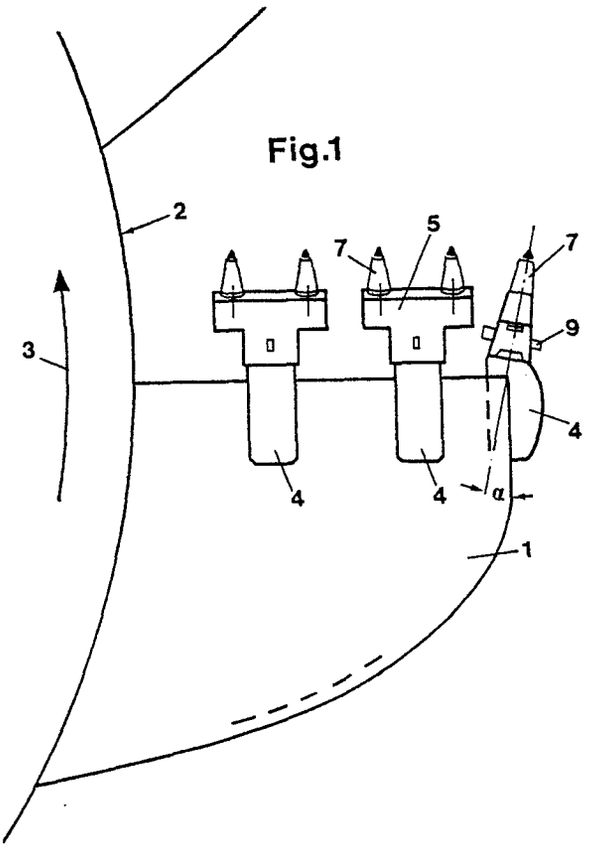
(54) Device in a bucket wheel.

(57) The present invention refers to a device in buckets (1) that are used for digging and/or extracting soil formations, a number of cutting means (7) bein mounted in holders (5) that are arranged along the edge of the bucket (1).

In bucket wheel excavators, that have extremely large dimensions, it is at regular intervals necessary to exchange teeth along the edge of the bucket. This is both expensive and difficult as to handling since also the teeth are of a relatively large dimension. The invention is characterized in that normally only cutting means (7) having a hard material point are exchanged and that the invention also brings about an even wearing of the hard material point (8).

Fig.1



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Device in a bucket wheel

The present invention refers to a device in buckets that are used for digging and/or extracting soil formations, a number of cutting means being mounted in holders that are arranged along the edge of the bucket.

Buckets of the above-mentioned type are used in bucket wheel excavators having a number of buckets attached along the circumference of a rotating drum. The bucket wheel excavators have normally very large dimensions and they are mobile, e.g. supported by caterpillars or the like.

The buckets of known bucket wheel excavators do usually have teeth that are mounted along the edges of the buckets. These teeth, that often are manufactured from manganese steel, are subjected to a relatively quick wear. Therefore, the teeth must be exchanged at regular intervals.

The teeth are usually detachably mounted to fastening means on the bucket, said mounting being carried out by a wedge joint or a conical joint.

An obvious disadvantage of the prior art is that the whole tooth is exchanged although normally only the point is worn out.

A further disadvantage of the prior art is that since the whole tooth is exchanged it is complicated from a handling point of view due to the large dimensions involved.

The aim of the present invention is to disclose a device of the above-mentioned type where only a part of the tooth, i.e. the cutting means, is exchanged. This means essential advantages both from economic and handling aspects. Also the cutting means are designed to achieve an even wearing of the points of the cutting means.

The aim of the present invention is realized through a device that is provided with the characteristics of the appending claims.

Below an embodiment of the invention is described with reference to the accompanying drawings where Fig. 1 discloses a side view of a bucket on a bucket wheel excavator, said bucket being provided with a device according to the invention; Fig. 2 discloses an exploded view of a hard material tool and a holder of the device according to the invention; Fig. 3 discloses in top view a portion of a bucket according to the invention; and Fig. 4 discloses a front view of a bucket according to the invention.

The bucket 1 disclosed in Figs. 1 - 3 is together with a number of similar buckets constituting a part of a bucket wheel excavator, said buckets 1 being mounted on the circumference of a rotatable drum 2, that is only indicated in Fig. 1. The direction of rotation of the drum 2 is marked by an arrow 3 in Fig. 1.

As can be learnt from the Figures the bucket 1 is connected to the drum 2 by, for instance, welding. In the disclosed embodiment the upper edge of the bucket 1 has a substantially radial extension relative to the axis of rotation of the drum 2.

From the top view of the bucket 1 disclosed in Fig. 2 it can be learnt that said bucket 1 has a basical cross-section of rectangular shape.

Along the upper, free edge of the bucket 1 a number of fastening means 4 are provided, said means 4 being connected to the bucket 1 through welding or in another suitable way.

The fastening means 4 support holders 5, that in the disclosed embodiment have seats 6 for two cutting means 7 provided with hard material points 8.

The holders 5 are detachably connected to the fastening means 4 through wedges 9, see Fig. 4, said wedges 9 extending through openings both in the holders 5 and in the fastening means 4. By displacing the openings in the respective parts somewhat relative to each other in the axial direction of the cutting means 7 a certain clamping effect is achieved when the wedges 9 are mounted.

Within the scope of the present invention it is of course also possible to use wedges that taper towards one end.

By anchoring the holders 5 to the fastening means 4 through wedges 9 a worn or damaged holder 5 can quickly and easily be exchanged.

The cutting means 7 are of conventional type, i.e. they have a hard material point 8 and a shaft 10, said shaft being symmetrical in respect to the longitudinal axis of the cutting means 7. To adapt to the type of soil formation that is worked, the design and fastening of the hard material points 8 can within the scope of the invention vary in each specific case.

As is indicated in fig. 2 the cutting means 7 are thus mounted with their shafts 10 in the seats 6 of the holders 5, said cutting means 7 being rotatable relative to their longitudinal axis and detachably fixed in axial direction through a locking ring (not shown) provided on the shaft 10 of each cutting means 7. Due to the fact that the locking ring is accessible from the lower side of the holder 5 it is quite simple to remove a worn-out cutting means 7 from its seat and replace it by a new one. When dealing with bucket wheel excavators the dimensions are very large. Therefore it is of course favourable if the part that normally needs to be exchanged is as small as possible.

As can be seen from the figures the longitudinal axis of the cutting means 7 inclines a certan angle relative that portion of the bucket that re-

ceives the adherent fastening means 4. said angle is marked by α in the Figures and usually has a magnitude of 10 - 15°.

By this inclination of the cutting means 7 relative to the adherent portions of the bucket 1 a rotary motion relative to its longitudinal axis is imparted to the cutting means 7 when they engage the soil formation that is worked. This contributes to an even wearing of the hard material points 8 of the cutting means 7.

In the disclosed embodiment every holder 5 comprises two seats 6 for cutting means 7. Within the scope of the invention it is of course possible to have a varying number of cutting means that belong to each holder 5. The same is also true for the number of holders and adherent fastening means 4 that are mounted along the edge of the bucket.

According to a preferred embodiment of the invention the fastening means are of standard type. This means that holders 5 can be mounted on buckets in operation. The invention is thus not only useful in newly manufactured buckets but can also serve as an exchange system when reconditioning existing equipment.

Claims

1. Device in buckets (1) that are used for digging and/or extracting soil formations, a number of cutting means (7) mounted in holders (5) that are arranged along the edge of the bucket (1),
characterized in that the cutting means (7) are rotatable relative to their longitudinal axis and detachably fixed against axial displacement in the holders (5).

2. Device according to claim 1,
characterized in that the holders (5) are connected to the bucket (1) via fastening means (4), that are permanently anchored to the bucket (1), said holders (5) being detachably connected to the fastening means (4).

3. Device according to claim 2,
characterized in that the connection between the holders (5) and the fastening means (4) is provided by a wedge joint.

4. Device according to any one of the previous claims,
characterized in that the longitudinal axes of the cutting means (7) form an angle (α) in the magnitude of 2 - 25°, preferably 10 - 15°, relative to the portion of the bucket (1) supporting the cutting means (7), said cutting means (7) being inclined away from the centre of the bucket (1).

5. Device according to any one of the previous claims,
characterized in that the fastening means (4) are of standard type.

Fig.1

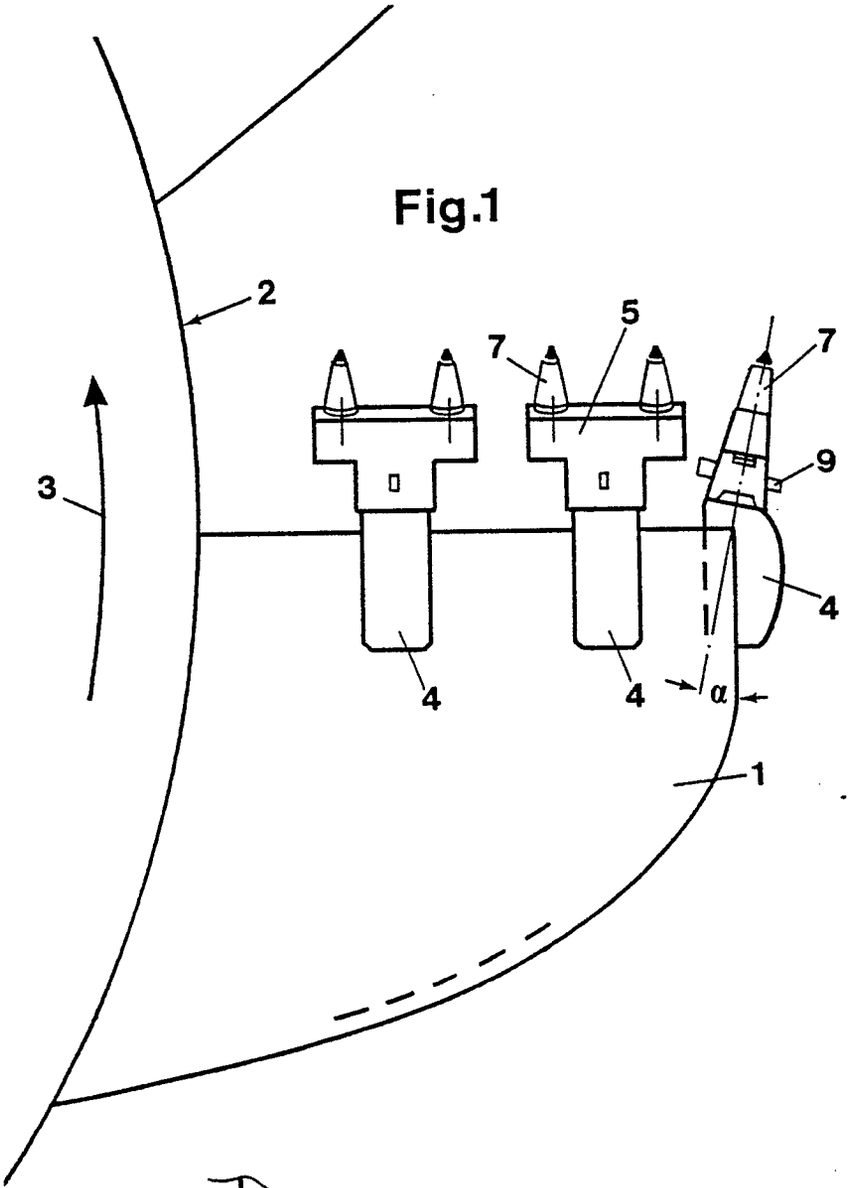


Fig.2

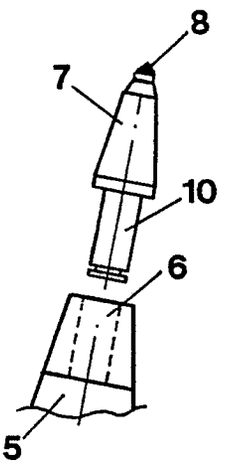


Fig.3

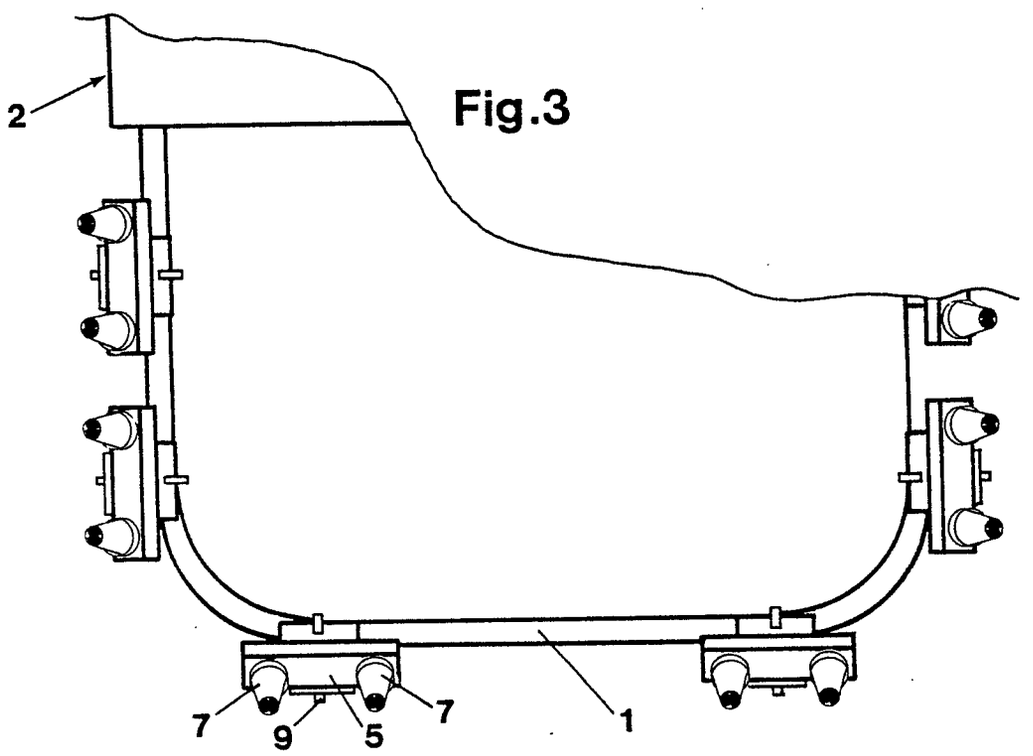
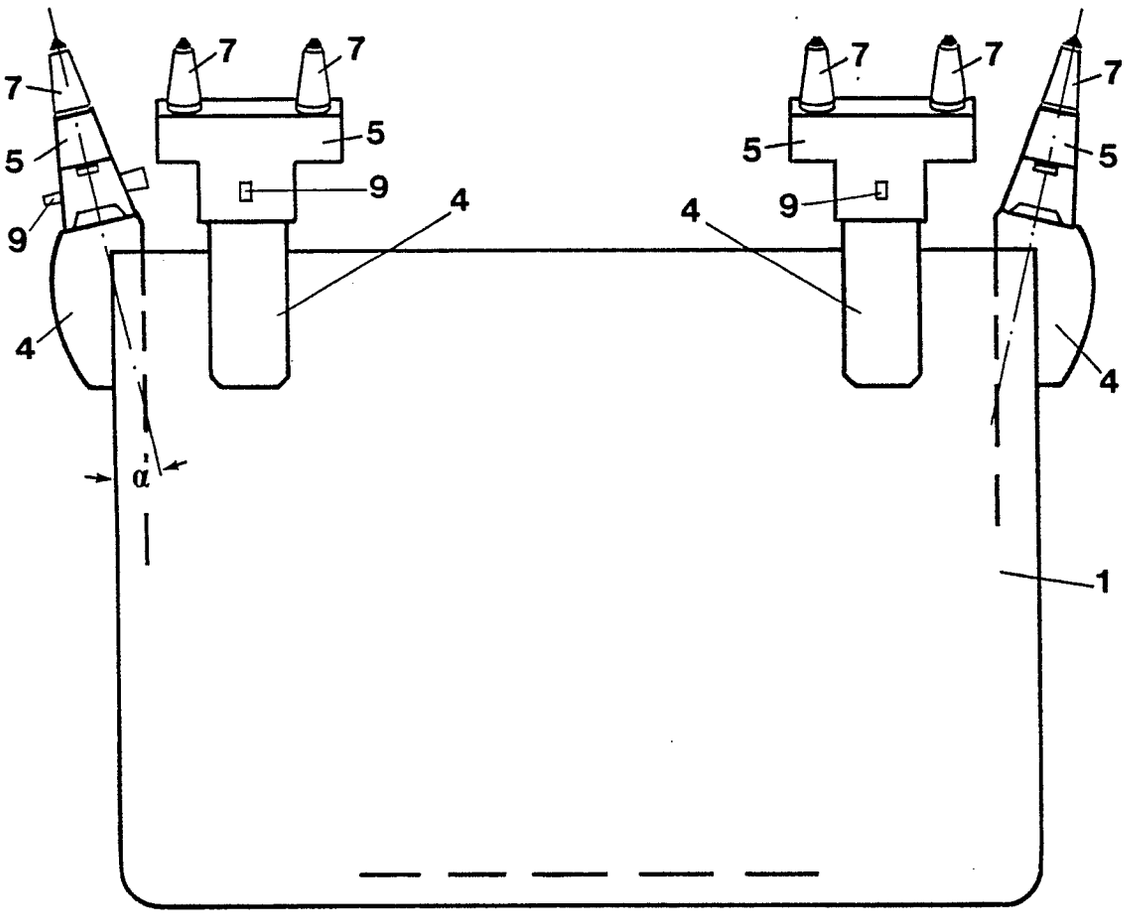


Fig.4



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EUROPEAN SEARCH REPORT

Application number

EP 87 85 0061

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.4)
X	GB-A- 897 280 (THE CLEVELAND TRENCHER CO.) * Page 1, lines 37-45; figures 1-37 *	1-5	E 02 F 9/28 E 02 F 3/40
X	US-A-4 489 986 (DZIAK) * Column 2, lines 44-66; figures 1,2 *	1,5	
X	CA-A- 896 423 (K.M. WHITE) * Page 1, line 27 - page 2, line 11; figures 1-5 *	1-5	
X	DE-C-3 538 355 (R. BERCHEM et al.) * Column 2, lines 30-33; figures *	1,5	
X	US-A-4 595 241 (GILBERT et al.) * Column 1, lines 50-59; figures 1-18 *	1,5	TECHNICAL FIELDS SEARCHED (Int. Cl.4) E 02 F
A	EP-A-0 184 209 (LEHNHOFF) * Abstract; figure 1 *	1	
A	US-A-4 577 423 (HAHN) * Abstract; figures 1-10 *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22-09-1987	ANGIUS P.

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X : particularly relevant if taken alone
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