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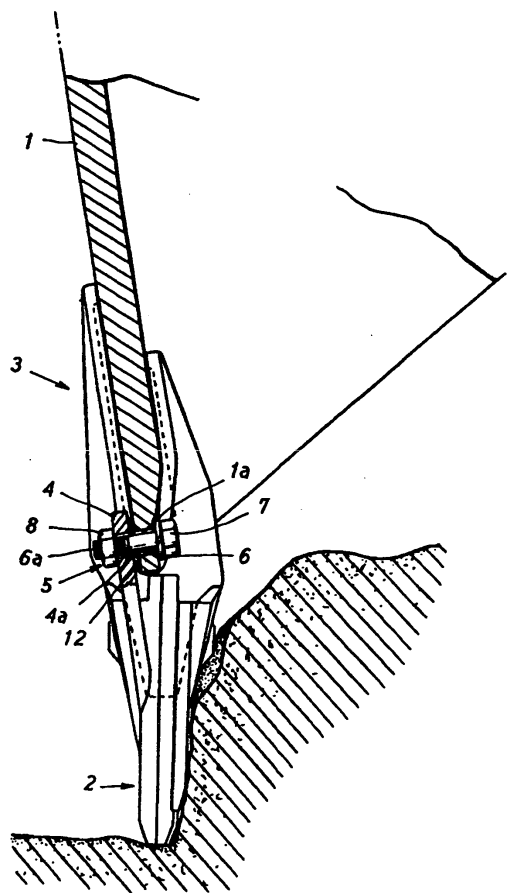
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(54) **Excavator bucket tooth**

(57) A tooth block (2) to be attached to a bucket (1) for a shovel machine, wherein the tooth block (2) is removably attached to the bucket (1) through an adapter member (3) provided at the lip of the bucket and projecting therefrom. The tooth block (2) is provided with a masking portion (4) for masking the gap produced between the lip of the bucket (1) and the base of the tooth block (2) when the tooth block (2) is attached to the lip of the bucket (1). The masking portion (4) is provided outside the base of the tooth block (2) such that the masking portion (4) is overlapped with the outer surface of the lip of the bucket (1), and is connected and fixed to the bucket (1) through a fixing portion (5).

FIG.3



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Description

[0001] The present invention relates to a tooth block to be attached to a bucket for a shovel machine to be used for civil engineering works or the like, and a bucket for the same.

[0002] Conventionally, with a bucket for a shovel machine, such as a power shovel and a shovel loader, the base of an adapter member is fixed to the bottom lip of the bucket by welding or other method, and the engaging recess portion of the tooth block for land grading is fitted to the adapter member, which is integrally fixed to the tooth block with such fixing means as a lock pin member. By using such a bucket, grading of soil, gravels, debris and the like dug out, and the loading of them into a lorry, have been performed.

[0003] However, this conventional type of construction has presented a problem that, when the engaging recess portion of the tooth block is fitted to the tooth block and fixed with fixing means, a gap is produced between the base of the tooth block and the lip of the bucket. Through this gap, the soil or gravels are spilled when scooping soil or gravels with the bucket, which lowers the working efficiency in addition to making the working site messy.

[0004] Then, to solve the above-stated problem, the present applicant has proposed a bucket mechanism for a shovel machine by the Utility Model Registration No. 3,052,290.

[0005] This bucket mechanism for a shovel machine is provided with a masking plate on one surface or both top and bottom surfaces of the base of the tooth block which, when the engaging recess portion of the tooth block is fitted to the adapter member attached to the lip of the bucket and fixed with fixing means, masks the gap produced between the respective right and left base portions around the engaging recess portion of the tooth block and the lip of the bucket.

[0006] Thus, a problem that, when the bucket scoops up soil, gravels, or the like, the soil, gravels, or the like can be spilled out has been solved, which allows the working to be comfortably carried out and the working efficiency to be increased.

[0007] The present applicant has performed further researches and experiments about a tooth block which has such a masking plate, and has developed a tooth block to be attached to a bucket for a shovel machine, and a bucket for the same, which are unique and have an extremely high commercial value.

[0008] Accordingly, from one aspect, the present invention provides a tooth block to be attached to a bucket for a shovel machine, wherein the tooth block is removably attached to the bucket through an adapter member provided at the lip of the bucket, being projected therefrom, and the tooth block is provided with a masking portion for masking the gap produced between the lip of the bucket and the base of the tooth block when the tooth block is attached to the lip of the bucket, the masking

portion being provided outside the base of the tooth block such that the masking portion is overlapped with the outer surface of the lip of the bucket, and is connected and fixed to the bucket through a fixing portion.

[0009] In one embodiment, the fixing portion is configured such that the masking portion is tightened and fixed to said bucket.

[0010] The fixing portion may comprise a bar-like member to be inserted into the overlapping portions of the bucket and the masking portion, and contacting members which are provided for this bar-like member to be in contact with the inner and outer surfaces of the overlapping portions, respectively, for sandwiching these portions.

[0011] The masking portion may be integrally formed with the base of the tooth block.

[0012] From another aspect, the present invention provides a bucket for a shovel machine, wherein the bucket comprises the tooth block according to the first aspect.

[0013] According to the present invention, the gap produced between the lip of the bucket and the tooth block, when the tooth block is attached to the lip of the bucket through the adapter member, is masked by the masking member. Therefore, in scooping up soil or gravels, for example, with the bucket, the possibility of the soil or gravels being spilled through the gap produced between the lip of the bucket and the tooth block is minimized.

[0014] According to the present invention, this masking member is provided outside the base of the tooth block, such that the masking member is overlapped with the outer surface of the lip of the bucket and is connected and fixed to the bucket through the fixing portion.

[0015] Therefore, when the tooth block digs the ground and is drawn inward, the outward force applied to the tooth block can be positively borne to prevent the breakage. In other words, the force applied to the tooth block is not borne only by the adapter member as conventional, but can be borne by the bucket, being distributed thereinto. Therefore, the possibility of the adapter member being damaged can be minimized with the durability of the tooth block being substantially improved. Also the masking member is fixed by means of the fixing portion rather than the masking member being only contacted with the outer surface of the bucket, so that if a gap were produced between the outer surface of the bucket and the masking portion, resulting from the difference in accuracy and conditions in manufacturing, the positive fixing makes a play difficult to be produced, resulting in the durability being reliably improved.

[0016] As can be seen from the above description, the present invention provides a unique functional effect which has not been conventionally obtained, and thus creates an extremely high commercially valuable product.

[0017] The invention will be described by way of example with reference to the accompanying drawings, in

which:-

FIG. 1 is a perspective view showing one embodiment of the invention;

FIG. 2 is a plan view illustrating the embodiment;

FIG. 3 is a sectional side view of the critical portion related to the embodiment;

FIG. 4 is an explanatory drawing of the embodiment in use, and;

FIG. 5 is another explanatory drawing of the embodiment in use.

[0018] The drawings illustrate one embodiment of the present invention, and here is a description of the embodiment.

[0019] Numeral 1 denotes a bucket for a shovel machine A, and numeral 3 an adapter member fixed to the bottom lip of the bucket 1 by welding or other method.

[0020] The present embodiment provides a tooth block 2 to be attached to the bucket 1 for the shovel machine A, which tooth block is made of an appropriate metallic material, an engaging recess portion 2b to be fitted to the nose of the adapter member 3 being provided in the middle portion of the base of a rectangular plate-like element (grading plate) having a blade portion 2a at the tip, as shown in FIG. 1 and FIG. 2.

[0021] In this engaging recess portion 2b, a hole 2b' is formed in the top thereof such that, when the engaging recess portion is fitted to an engaging projection portion 3a at the nose of the adapter member 3, the hole 2b' matches to a hole 3a' provided in the engaging projection portion at the nose of the adapter member and, by inserting a lock pin member 9 into these matching holes, the adapter member 3 can be integrally connected to the tooth block 2. Numeral 11 denotes an elastic plastic element for preventing the lock pin member 9 from dropping off.

[0022] In the right portion of the tooth block 2, a small thickness flat plate-like portion 2c which is recessed through a step on the outer surface side thereof is provided. The left portion of the tooth block 2 comprises a small thickness flat plate-like portion 2d which is recessed through a step on the inner surface side thereof and a projected plate portion 2e which is disposed above the flat plate-like portion 2d with a prescribed spacing, thus providing a sandwiching connection 10 which is capable of sandwiching a flat plate-like portion 2c provided in the right side portion of another tooth block 2.

[0023] Therefore, the tooth block 2 can be connected with a prescribed number of other tooth blocks 2 as shown in FIG. 2, and these respective tooth blocks 2 can be fixed to the lip of the bucket 1 through the pertinent adapter member 3. The tooth blocks 2 disposed at right and left in FIG. 2 are tooth blocks 2 dedicated for use at the sides, respectively. The tooth block 2 for use on the left side is provided with a flat plate-like portion 2c in the right side portion thereof, but not provided with

a sandwiching connection 10 in the left side portion thereof, while the tooth block 2 for use on the right side is not provided with a flat plate-like portion 2c in the right side portion thereof, but provided with a sandwiching connection 10 in the left side portion thereof.

[0024] incidentally, when a prescribed number of tooth blocks 2 having a construction as stated above are connected to one another and fixed to the lip of the bucket 1, a gap is necessarily formed between the right and left base portions around the engaging recess portion 2b of the respective tooth blocks 2 and the lip of the bucket 1. This gap can be reduced in size by enhancing the manufacturing accuracy, which, however, is not feasible from the viewpoints of cost and mass productivity and, since the tooth blocks 2 are butted to the bucket 1 for connection, the gap is inevitably produced.

[0025] Then, in this embodiment, a masking portion 4 for masking the gap is provided.

[0026] The masking portion 4 is integrally formed outside the base of the tooth block 2 on the side thereof where the sandwiching connection 10 is provided, and is configured such that the masking portion is overlapped with the outer surface of the lip of the bucket 1 when the tooth block 2 is attached to the lip of the bucket 1.

[0027] Therefore, in scooping up soil or gravels, for example, with the bucket 1, the possibility of the soil or gravels being spilled through the gap produced between the lip of the bucket 1 and the tooth block 2 is minimized.

[0028] The masking portion 4 is fixed to the bucket 1 by means of a fixing portion 5.

[0029] Specifically, the fixing portion 5 comprises a bar-like member 6 to be inserted into through-holes 1a, 4a formed in the bucket 1 and the masking portion 4, respectively, as shown in FIG. 3, and contacting members 7, 8 which are in contact with the inner and outer surfaces of the overlapping portions of the bucket 1 and the masking portion 4, respectively, for sandwiching these portions.

[0030] One contacting member 7 is configured as a head formed at one end of the bar-like member 6, which is, for example, a bolt, and the other contacting member 8 is configured as a female screw (a nut) to be engaged with the threaded portion 6a of the bar-like member 6.

[0031] Thus, the fixing portion 5 presses the masking portion 4 against the bucket 1, sandwiching and tightening the overlapping portions thereof for fixing them to each other. In addition, by turning the contacting member 8, the degree of the pressure with which the masking portion 4 is pressed against the bucket 1 can be adjusted. Numeral 12 denotes a spacer.

[0032] Because the present embodiment is configured as above, the gap produced between the lip of the bucket 1 and the tooth block 2 when the tooth block 2 is attached to the lip of the bucket 1 through the adapter member 3 is masked by the masking member 4. Therefore, in scooping up soil or gravels, for example, with the bucket 1, the possibility of the soil or gravels being

spilled through the gap produced between the lip of the bucket 1 and the tooth block 2 is minimized.

[0033] This masking member 4 is provided outside the base of the tooth block 2 such that the masking member is overlapped with the outer surface of the lip of the bucket 1, and is connected and fixed to the bucket 1 through the fixing portion 5. Therefore, when the tooth block 2 digs the ground and is drawn inward, the outward force (the repulsive force) applied to the tooth block 2 can be positively borne.

[0034] Thus, according to the present embodiment, the force applied to the tooth block 2 is not borne only by the adapter member as conventional, but can be borne by the bucket 1, being distributed thereinto. Therefore, the possibility of the adapter member 3 being damaged can be minimized with the durability of the tooth block 2 being substantially improved. Furthermore, the masking member 4 is fixed by means of the fixing portion 5 rather than the masking member being only contacted with the outer surface of the bucket 1. Thus, if a gap were produced between the outer surface of the bucket 1 and the masking portion 4, resulting from the difference in accuracy and conditions in manufacturing, the positive fixing makes a play difficult to be produced, resulting in the durability being reliably improved.

[0035] In addition, the present embodiment is configured such that the masking portion 4 is pressed against the bucket 1, being tightened and fixed to the bucket, so that, if a gap were produced between the bucket 1 and the masking portion 4 due to frequent use, a satisfactory condition can always be obtained.

[0036] Further, with the present embodiment, the masking portion 4 is integrally formed with the base of the tooth block 2. The simple construction provides a lower cost and an excellent productivity, and assures a sufficient strength for bearing the force applied to the tooth block 2.

[0037] The present invention is not limited to the present embodiment, and the specific configuration of each component can be appropriately designed, within the scope of the appended claims.

Claims

1. A tooth block to be attached to a bucket (1) for a shovel machine, wherein the tooth block (2) is removably attachable to the bucket (1) through an adapter member (3) provided at the lip of the bucket (1) and projecting therefrom, the tooth block (2) being provided with a masking portion (4) for masking a gap produced between the lip of the bucket (1) and the base of the tooth block (2) when the tooth block (2) is attached to the lip of the bucket (1), the masking portion (4) being provided outside the base of the tooth block (2) such that the masking portion (4) is capable of overlapping with the outer surface of the lip of the bucket (1), and is connectable and

fixable to the bucket (1) through a fixing portion (5).

2. The tooth block according to claim 1, wherein said fixing portion (5) is configured such that the masking portion (5) is capable of being tightened and fixed to said bucket (1).
3. The tooth block according to claim 1 or 2, wherein said fixing portion (5) comprises a bar-like member (6) arranged to be inserted into the overlapping portions of the bucket (1) and the masking portion (4), and contacting members (7,8) which are provided for said bar-like member (6) arranged to be in contact with the inner and outer surfaces of the overlapping portions, respectively, for sandwiching said overlapping portions.
4. The tooth block according to any one of claims 1 to 3, wherein said masking portion (4) is integrally formed with the base of the tooth block (2).
5. A bucket for a shovel machine, wherein the bucket is provided with a tooth block according to any preceding claim.

FIG.1

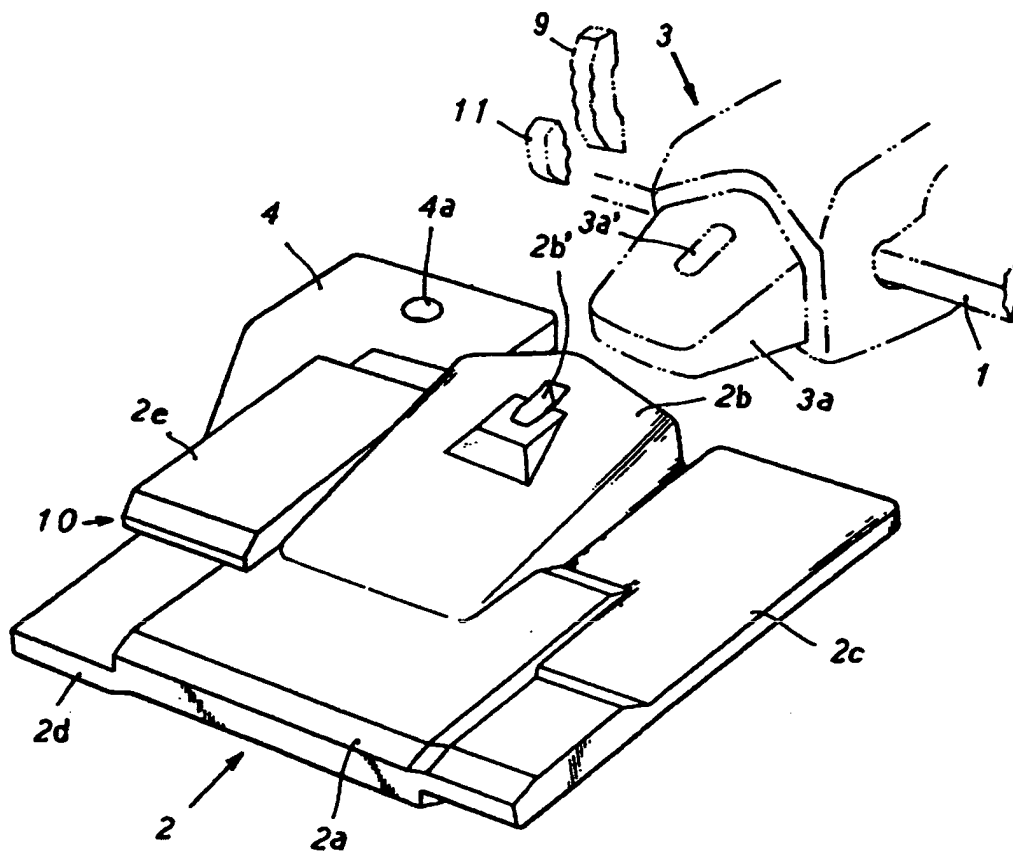


FIG.2

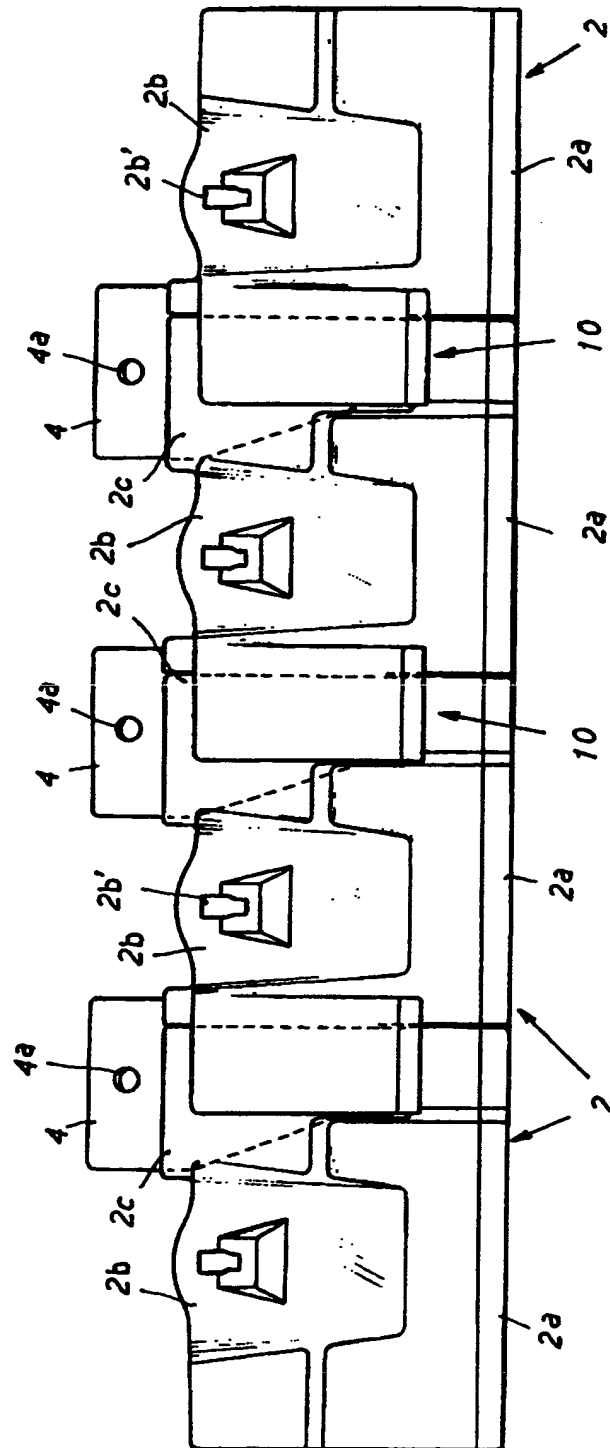


FIG.3

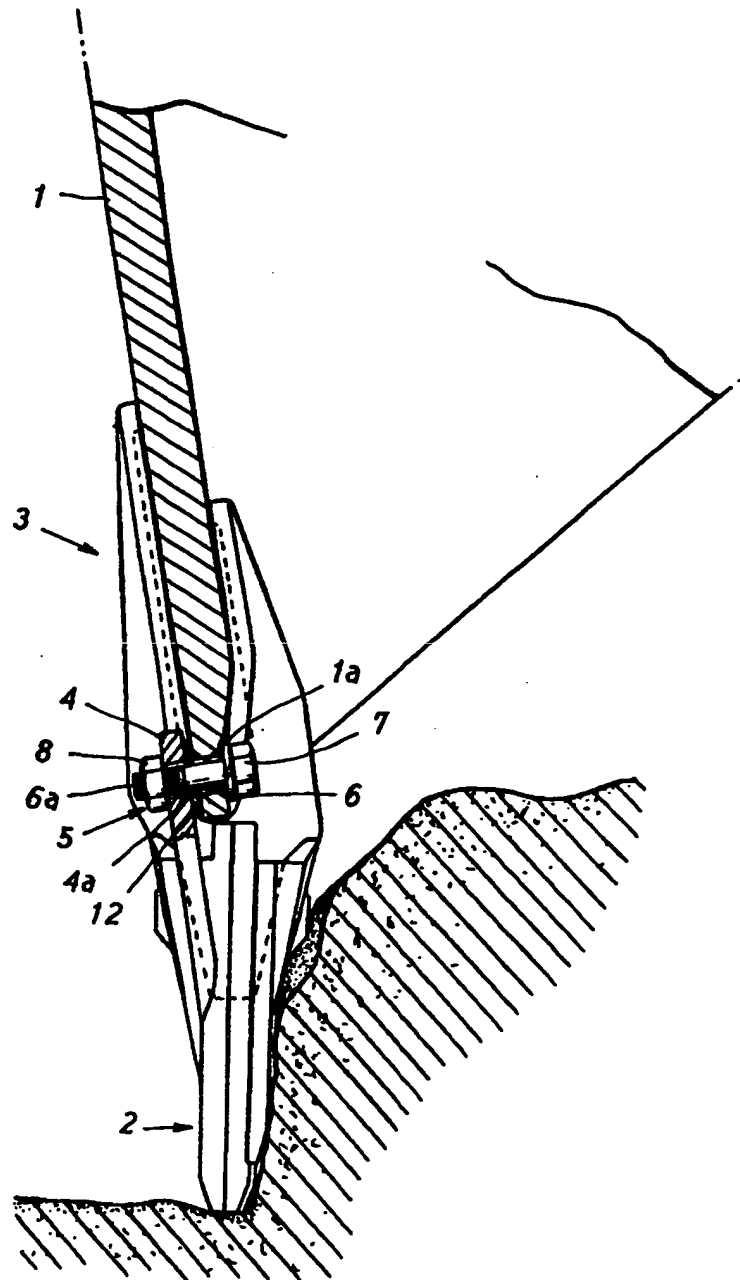


FIG.4

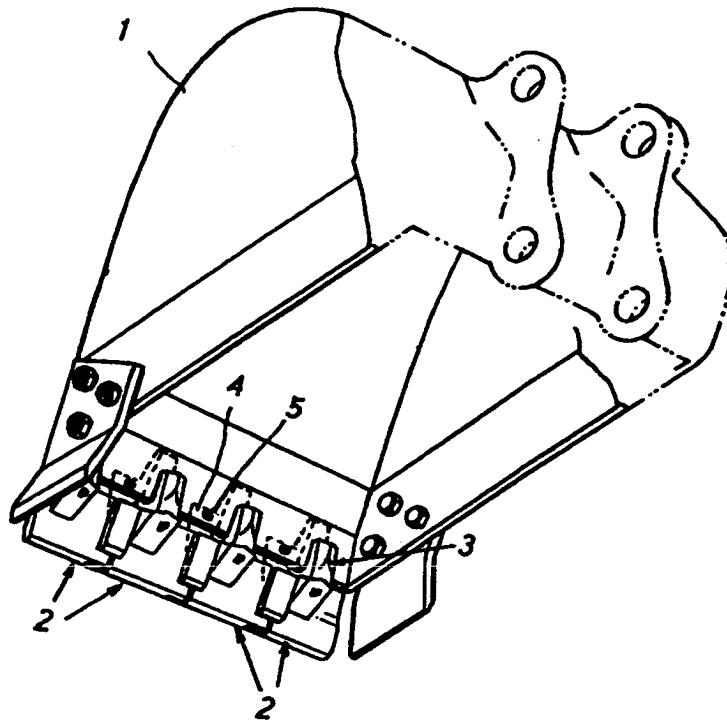


FIG.5

