Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2186137 C 2005/12/06

(11)(21) 2 186 137

(12) BREVET CANADIEN
CANADIAN PATENT

(13) C

(86) Date de dépôt PCT/PCT Filing Date: 1995/03/02
(87) Date publication PCT/PCT Publication Date: 1995/09/28
(45) Date de délivrance/Issue Date: 2005/12/06
(85) Entrée phase nationale/National Entry: 1996/09/20
(86) N° demande PCT/PCT Application No.: SE 1995/000218
(87) N° publication PCT/PCT Publication No.: 1995/025851
(30) Priorité/Priority: 1994/03/21 (9400935-4) SE

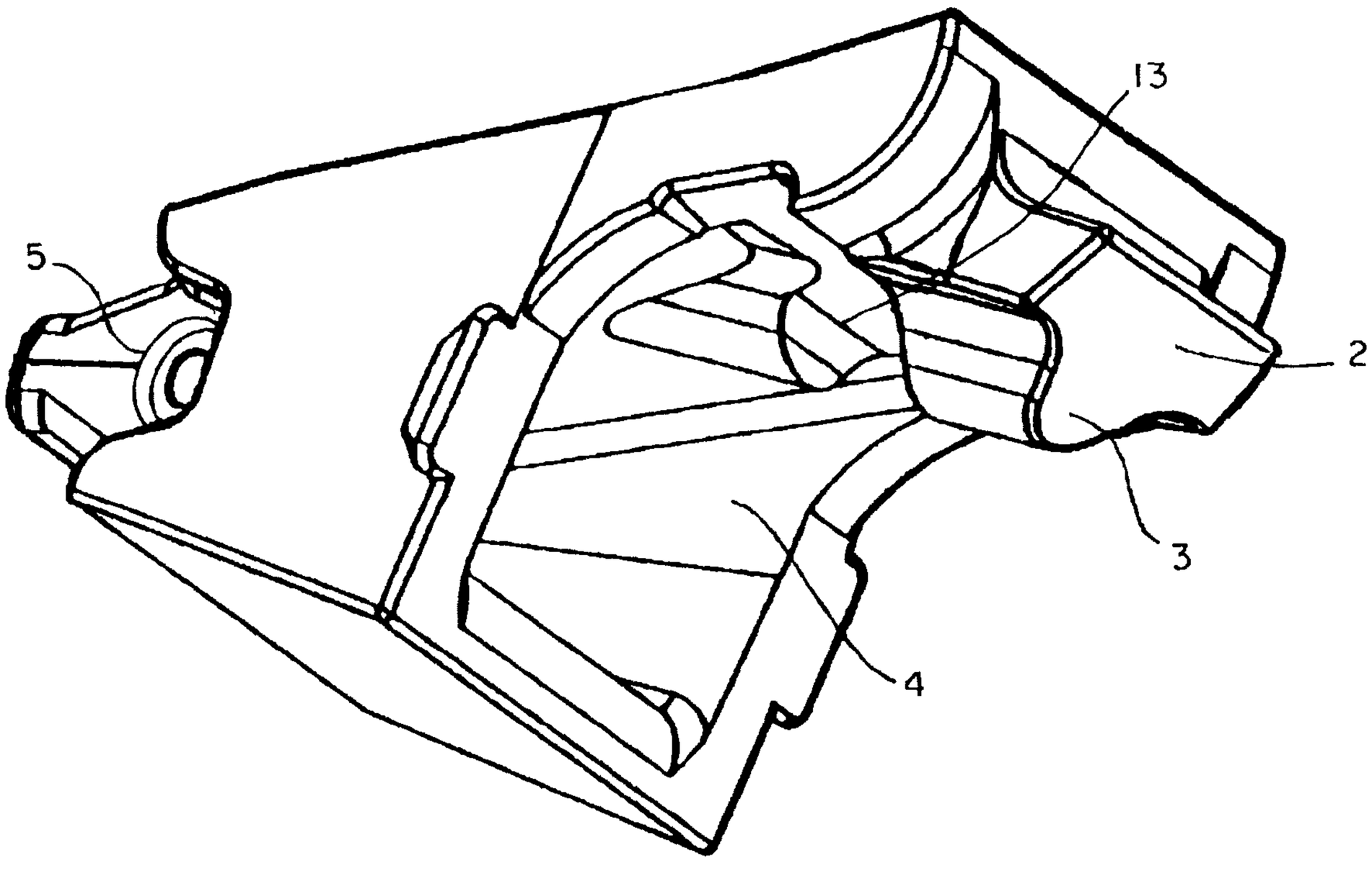
(51) Cl.Int.^{6}/Int.Cl.^{6} E02F 9/28

(72) Inventeur/Inventor:
QUARFORDT, PER ULF TORGNY, SE

(73) Propriétaire/Owner:
COMPONENTA WEAR PARTS AB, SE

(74) Agent: OGILVY RENAULT LLP/S.E.N.C.R.L.,S.R.L.

(54) Titre : ENSEMBLE DENT
(54) Title: TOOTH ARRANGEMENT



(57) Abrégé/Abstract:
The cutting edge of an excavator bucket is provided with a number of teeth comprising at least two parts that are exchangeably joined together. A turning movement and a displacement movement must be performed in order to join the parts. The invention constitutes a simplification in which only a pushing movement is required.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) **International Patent Classification** 6 :
E02F 9/28

A1

(11) **International Publication Number:** **WO 95/25851**

(43) **International Publication Date:** 28 September 1995 (28.09.95)

(21) **International Application Number:** PCT/SE95/00218

(22) **International Filing Date:** 2 March 1995 (02.03.95)

(30) **Priority Data:**
9400935-4 21 March 1994 (21.03.94) SE

(71) **Applicant** *(for all designated States except US)*: COMPONENTA TOOLS AB [SE/SE]; Box 250, S-681 24 Kristinehamn (SE).

(72) **Inventor; and**
(75) **Inventor/Applicant** *(for US only)*: QUARFORDT, Per, Ulf, Torgny [SE/SE]; Knektåsvägen 21, S-691 53 Karlskoga (SE).

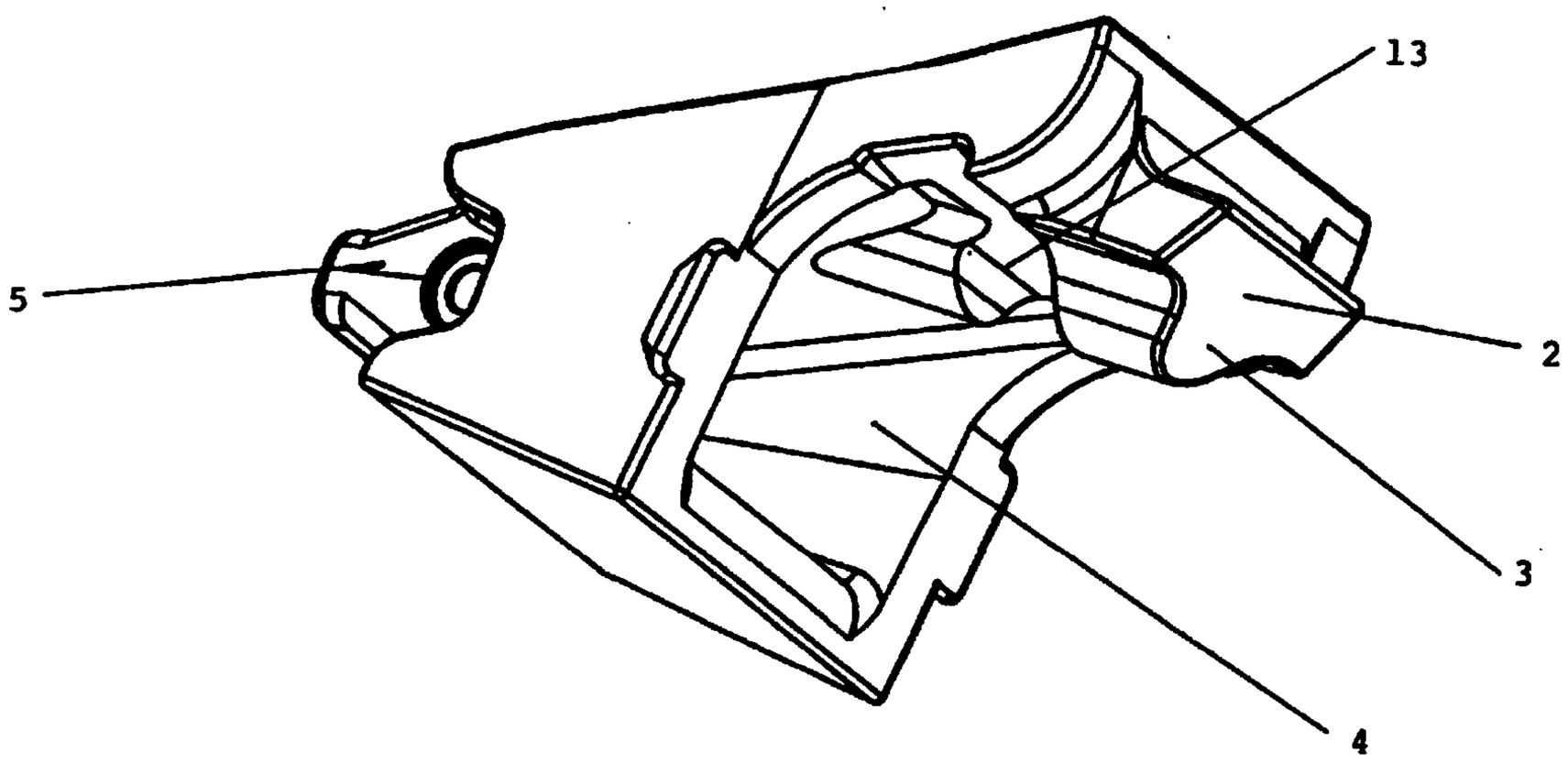
(74) **Agent:** LAUTMANN, Kurt; P.O. Box 245, S-691 25 Karlskoga (SE).

(81) **Designated States:** AU, BR, CA, JP, MX, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.

2186137

(54) **Title:** TOOTH ARRANGEMENT



(57) **Abstract**

The cutting edge of an excavator bucket is provided with a number of teeth comprising at least two parts that are exchangeably joined together. A turning movement and a displacement movement must be performed in order to join the parts. The invention constitutes a simplification in which only a pushing movement is required.

TOOTH ARRANGEMENT

The present invention relates to a tooth arrangement, preferably for use with machines for earth working. Such machines are generally provided with an excavator bucket having a cutting edge and thereon a number of holders provided with a tooth. In such an excavator the teeth are intended to loosen a ground surface which the cutting edge then transfers to the actual bucket space. The cutting edge of an excavator generally consists of a separate plate welded to the actual bucket, a number of holders being attached to the cutter. The holders are intended to receive a point adapter that is secured to the holder with the aid of a dowel. The free end of the point adapter is in turn provided with an arrangement for securing a point. A point adapter is attached to a holder by means of a turning movement followed by a displacement movement. This is a laborious procedure and also entails the drawback that the parts of the holder and point adapter that are to cooperate with each other are dimensioned too slimLY from the strength point of view.

It is one aspect of the invention to provide a tooth arrangement applied on a cutting edge of an excavator bucket, said tooth arrangement having opposite ends removably joined together, a first of the ends including a male part and a second of the ends including a female part, the ends being locked together by a dowel going through the male part and the female part, wherein the first end further includes a female part, the second end further includes a male part, the female and male parts being arranged one above the other, at least one of the male parts including a longitudinal ridge which cooperates with a longitudinal recess in the other male part so that when the ends are joined together, they constitute a transverse groove for insertion of the dowel.

It is another aspect of the invention to provide an excavation tooth arrangement comprising:

a point adapter having an upper male part with a ridge extending in a first longitudinal direction of the point adapter and a female portion extending in a second, opposite longitudinal direction of the point adapter, said ridge including a first groove in a transverse direction of the point adapter;

a holder having two arms extending in a first direction of the holder, a female portion for insertion of the point adapter male part, a male part including a recess configured to conform to the ridge of the point adapter, a second groove in a transverse direction of the holder; and

a dowel formed of a two portion frame and including means to hold the dowel in an inserted position when the point adapter is joined to the holder.

According to a preferred embodiment the transverse cavity for a dowel has a predetermined cross section so that if a dowel with the same cross section is inserted into said cavity, the dowel will always assume a predetermined position.

According to a preferred embodiment the dowel may be arc-shaped and be so oriented in said cavity for the dowel that the plane of the dowel will coincide substantially with the axial plane of the holder and the point adapter.

The wall of the groove in the ridge-like part of one of the male parts may be so displaced that the cavity formed when the parts are fitted together, acquires one or two pockets that can be used for snap-in members pertaining to the dowel used.

According to a preferred embodiment of the present invention the dowel is in the form of a frame with two longitudinal sides, the space between the sides being filled with a yielding material such as rubber. One longitudinal side of the dowel is suitably free from the rest of the frame, and can thus be displaced inwardly. The other longitudinal side of the frame is provided with a protrusion to limit the inward movement of the movable side.

The longitudinal side of the dowel frame that is not movable may be provided externally with a snap arrangement to be snapped into the pocket that may be formed in the transverse cavity, by the wall of the groove in one of the male parts.

However, it should be evident that the dowel arrangement described for joining the parts is not limited to use with a holder and a point adapter. Other uses for it are also possible where two optional parts are to be joined in which a groove is form that may have a pocket.

Other characteristics of the present invention are revealed in the following claims.

The present invention will be described more fully with reference to the accompanying drawings in which

Figure 1 shows a point adapter intended to be provided with a point and joined to a holder of the type, for instance, shown in
Figure 2 and
Figure 3 shows the frame of a key and
Figure 4 shows a complete key.

In the figures, there is shown a point adapter provided with a male part 2. The male part is provided with a longitudinal ridge 3 and a female part 4 is arranged below the male part to receive a male part 10 from a holder 6, shown in Figure 2. The male part 2 with longitudinal ridge 3 is provided with a transverse groove 13. The point adapter is provided at its left end with an attachment 5 for attachment of a point.

The point adapter is designed to be inserted in the left end of a holder 6 having two arms 7 and 8 for welding to the cutting edge which in turn is welded to the front end, at the base of an excavator. The holder 6 is provided with a female part 9 for the male part 2 with ridge 3. The male part 10 is provided with an axial recess 11 for the ridge 3, as well as a transverse groove 12.

Since the holder 6 is welded to a cutter, the male part 2 of the point adapter must be pushed directly into the female part 9, whereupon the male part 10 penetrates into the female part 4 of the point adapter. When the holder 6 and point adapter are fitted together the grooves 12 and 13 form a transverse cavity that may be provided with smooth walls running all the way through. Alternatively the walls of the grooves 13 may be displaced so that two pockets appear in the cavity formed by the two grooves 12 and 13. A dowel can then be inserted and if this is provided with snap-in members they will snap into the pockets so that the dowel is locked in position.

The two grooves 12 and 13, together forming a transverse cavity, have been shaped so that a predetermined cross section is obtained for the through-hole, which means that the dowel to be inserted in the cavity can only be inserted if it has a cross section corresponding to that of the

cavity. The dowel will then always have a predetermined orientation in the cavity and if it is provided with a snap arrangement, said snap arrangement will be located exactly aligned with a pocket.

It has proved suitable to manufacture a dowel as shown in Figure 3, formed by a frame of homogenous material, slightly curved. The frame has been designated 15 and consists of a loose, longitudinal frame part 16 and a stationary remaining frame part 17. The latter part of the frame is provided with a protrusion 18 intended to limit inward movement of the movable frame part 16. The frame part 17 has an external area intended for a snap arrangement. The space between the frame parts is filled with rubber, as shown in Figure 4 where the rubber filling is designated 20. The loose part 16 of the frame can also be seen in the drawing. Furthermore it can be seen that the space 19 for a snap arrangement is filled with rubber 21, the upper side of this being covered with a metal plate 22. When the key is inserted into the cavity formed by grooves 13 and 12, the metal plate 22 with the rubber 21 will be pressed into the pocket inside the cavity.

CLAIMS

1. A tooth arrangement applied on a cutting edge of an excavator bucket, said tooth arrangement having opposite ends removably joined together, a first of the ends including a male part and a second of the ends including a female part, the ends being locked together by a dowel going through the male part and the female part, wherein the first end further includes a female part, the second end further includes a male part, the female and male parts being arranged one above the other, at least one of the male parts including a longitudinal ridge which cooperates with a longitudinal recess in the other male part so that when the ends are joined together, they constitute a transverse groove for insertion of the dowel.

2. The tooth arrangement according to claim 1, wherein the transverse groove has a predetermined cross section configured for the dowel with a corresponding cross section so that the dowel has a predetermined orientation when inserted in the transverse groove.

3. The tooth arrangement according to claim 1 or 2, wherein one of the male parts is ridged, a wall of the transverse groove of the ridged male part is provided with a recess so that when the ends are fitted together, a pocket appears in the transverse groove capable of retaining the dowel in a snap-fit manner.

4. The tooth arrangement according to claim 3, wherein the dowel is formed by an oblong frame surrounding a yielding material.

5. The tooth arrangement according to claim 4, wherein a longitudinal side of the frame is separated from a remaining portion of the frame.

6. The tooth arrangement according to claim 5, wherein the longitudinal side constitutes a first longitudinal side, a second longitudinal side of the frame is provided with an inwardly directed protrusion to limit an inward movement of said first longitudinal side of the frame.

7. The tooth arrangement according to claim 6, wherein said second longitudinal side is provided externally with an outwardly directed arrangement capable of engaging the transverse groove in a snap-fit.

8. An excavation tooth arrangement comprising:

a point adapter having an upper male part with a ridge extending in a first longitudinal direction of the point adapter and a female portion extending in a second, opposite longitudinal direction of the point adapter, said ridge including a first groove in a transverse direction of the point adapter;

a holder having two arms extending in a first direction of the holder, a female portion for insertion of the point adapter male part, a male part including a recess configured to conform to the ridge of the point adapter, a second groove in a transverse direction of the holder; and

a dowel formed of a two portion frame and including means to hold the dowel in an inserted position when the point adapter is joined to the holder.

9. The excavation tooth arrangement according to claim 8, wherein the dowel includes a first portion frame made of slightly curved homogenous material, a second portion frame being movable with respect to the first portion frame which

is further provided with a protrusion which limits movement of the second frame portion;

and wherein said means to hold the dowel in inserted position includes an external area in the second frame portion, a rubber inserted in the first portion frame protrusion and a metal plate cover; said cover being pressed by the rubber into a pocket which is formed by cavities in said first groove and said second groove.

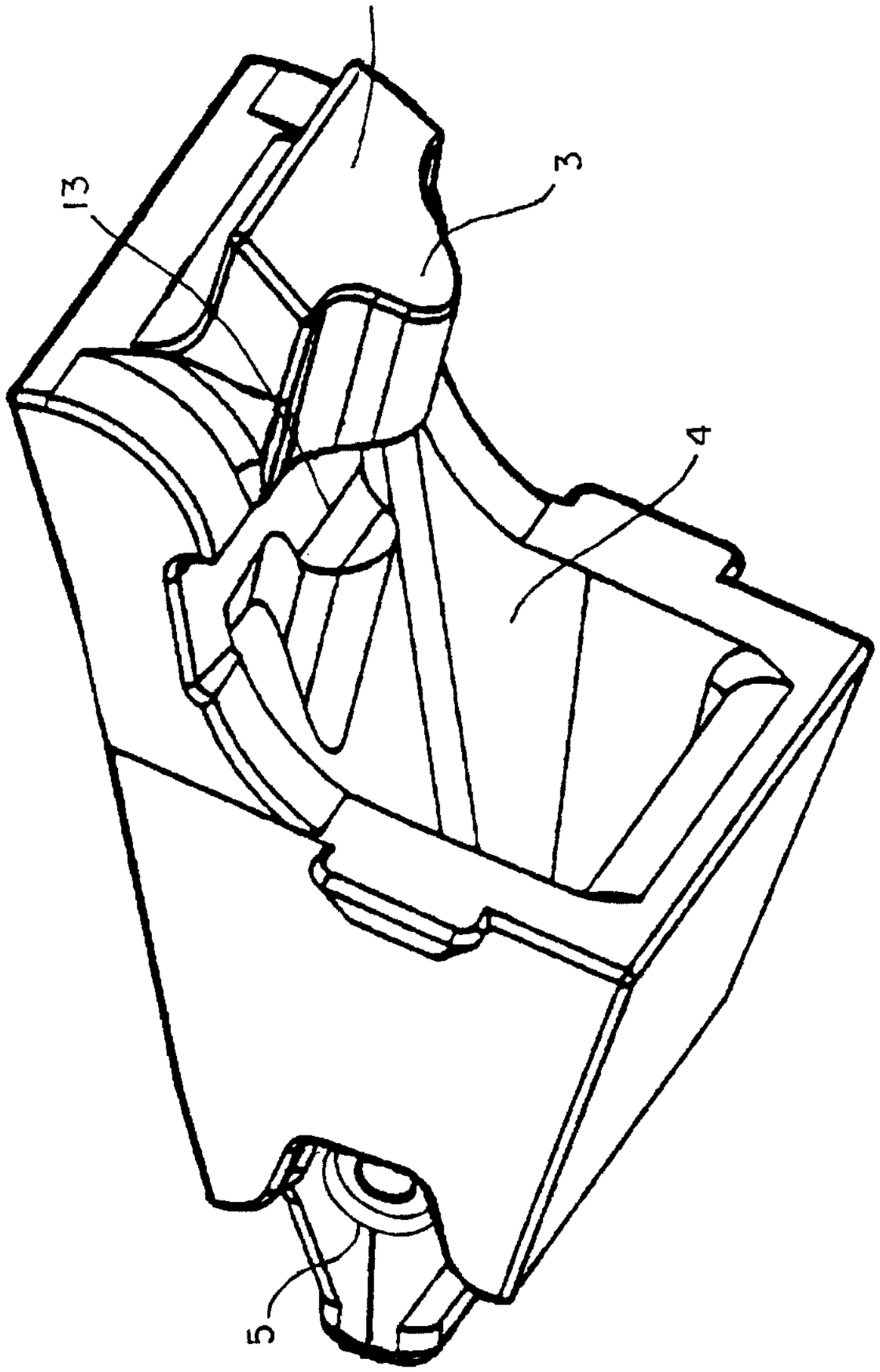


FIG. 1

FIG. 2

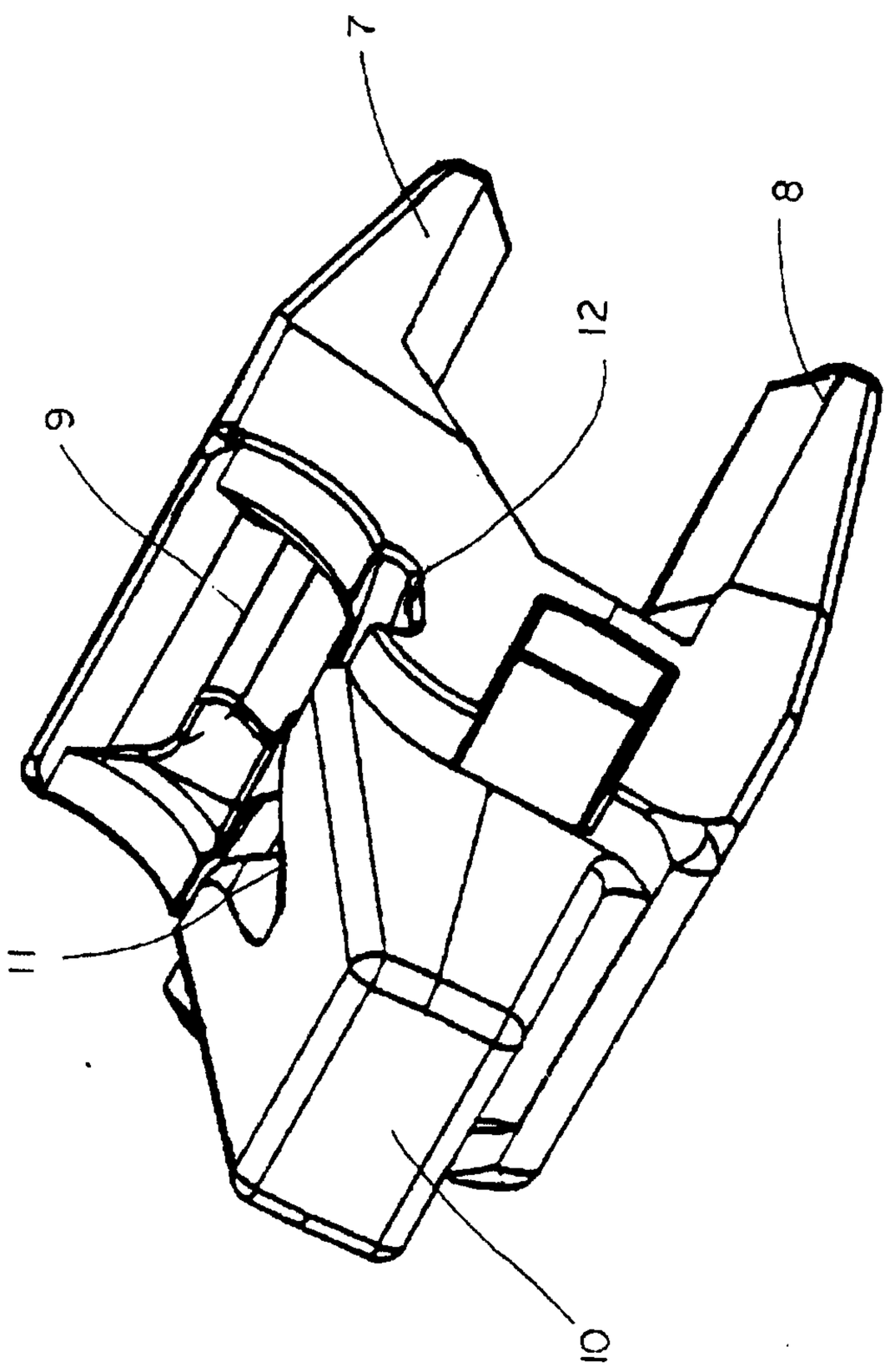
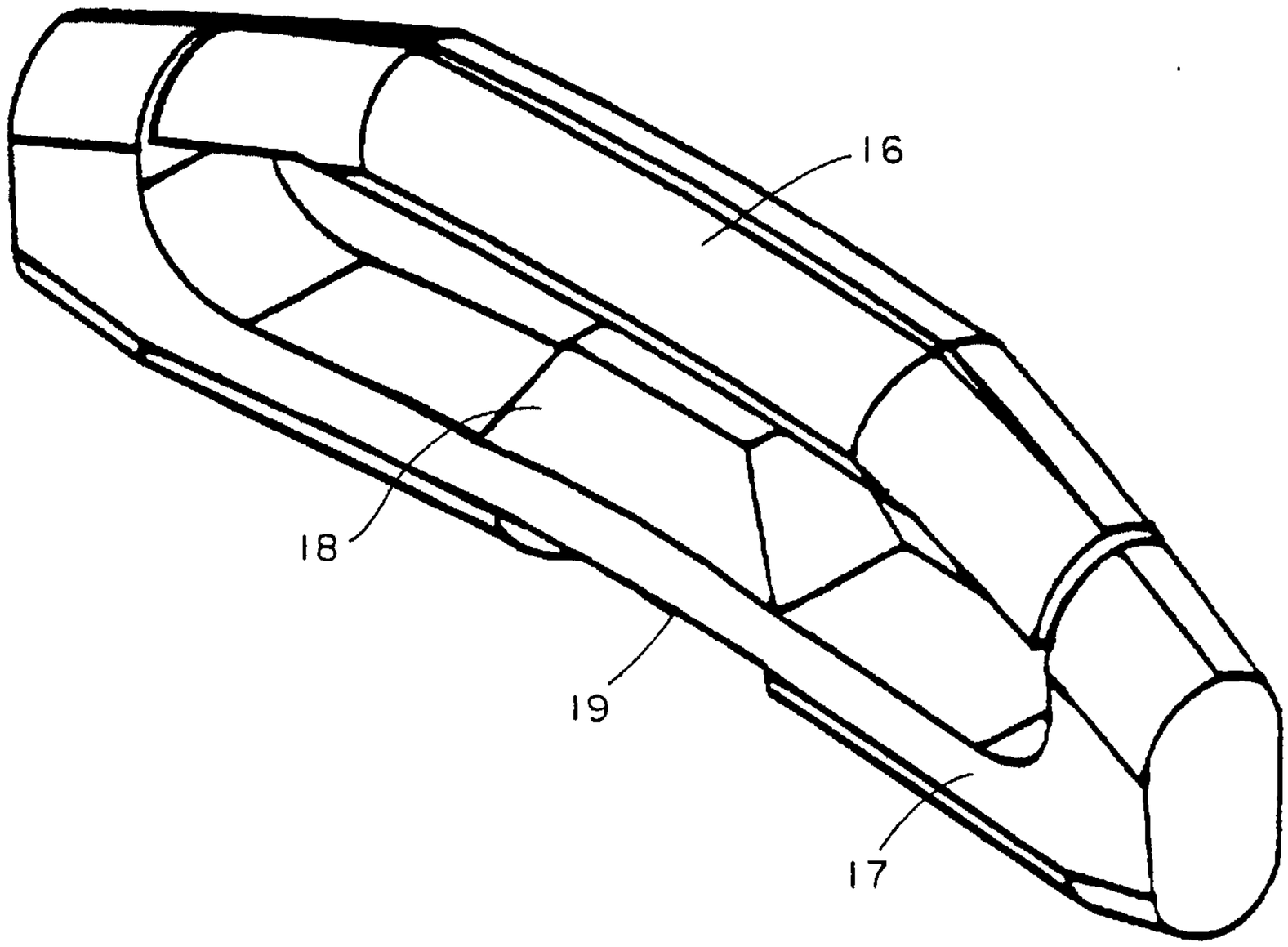


FIG. 3



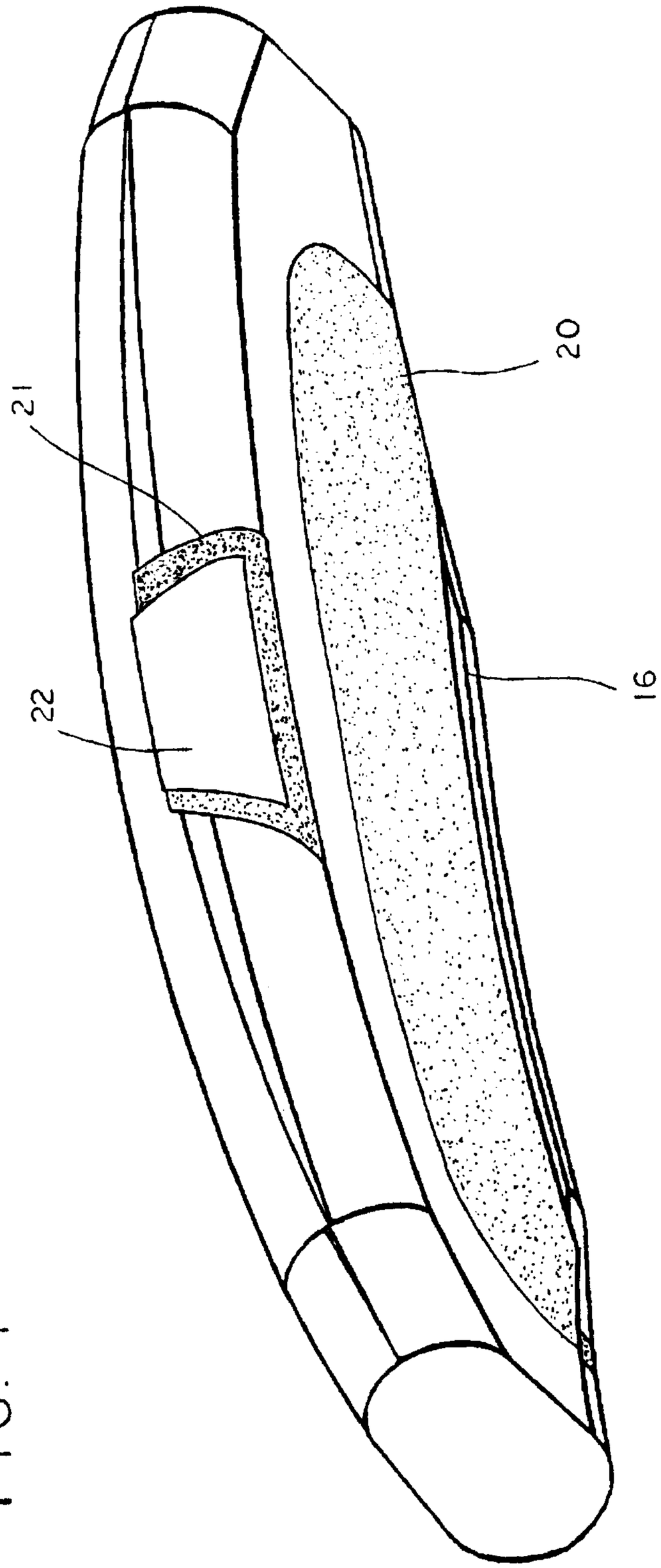
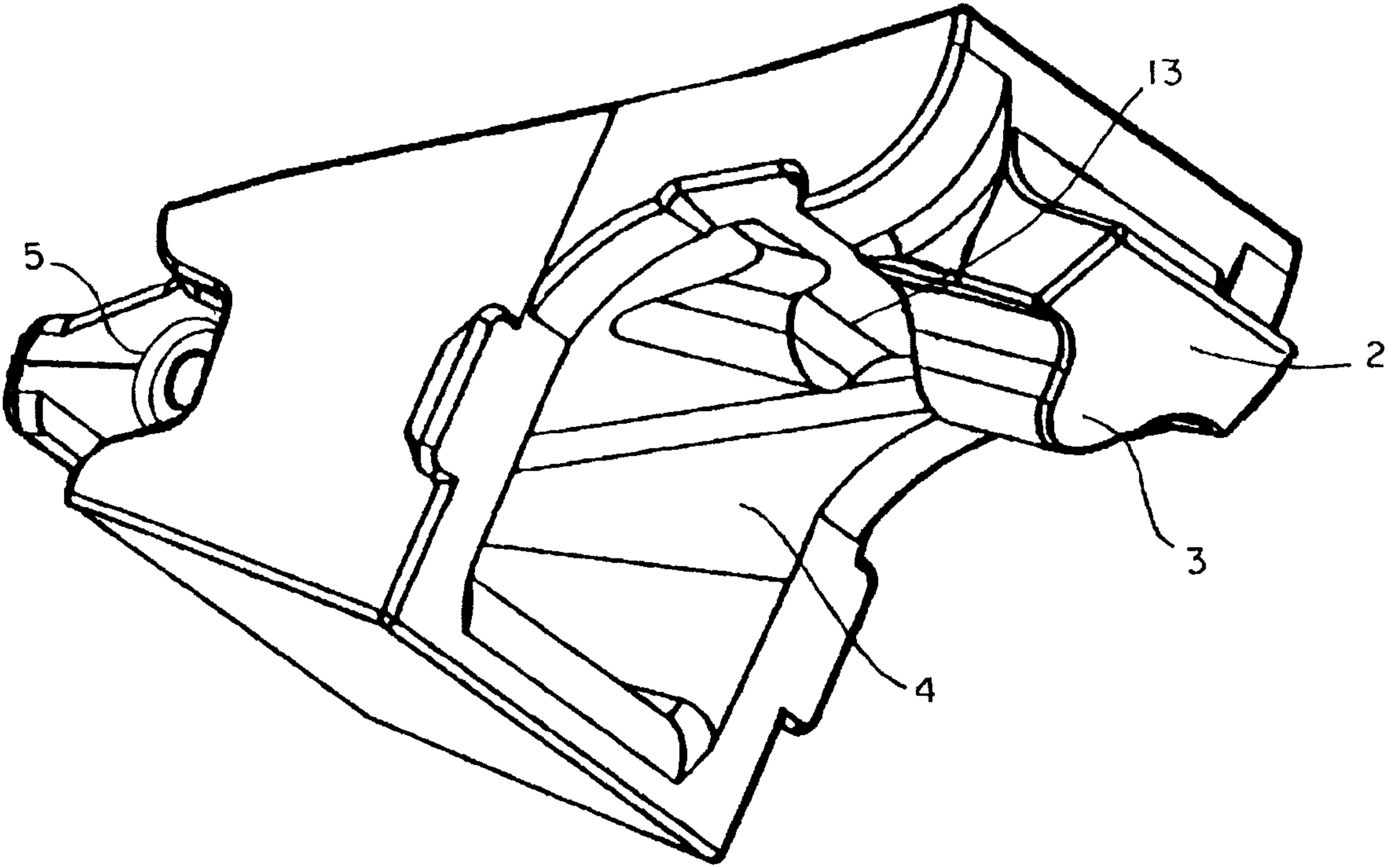


FIG. 4


13
5
2
3
4