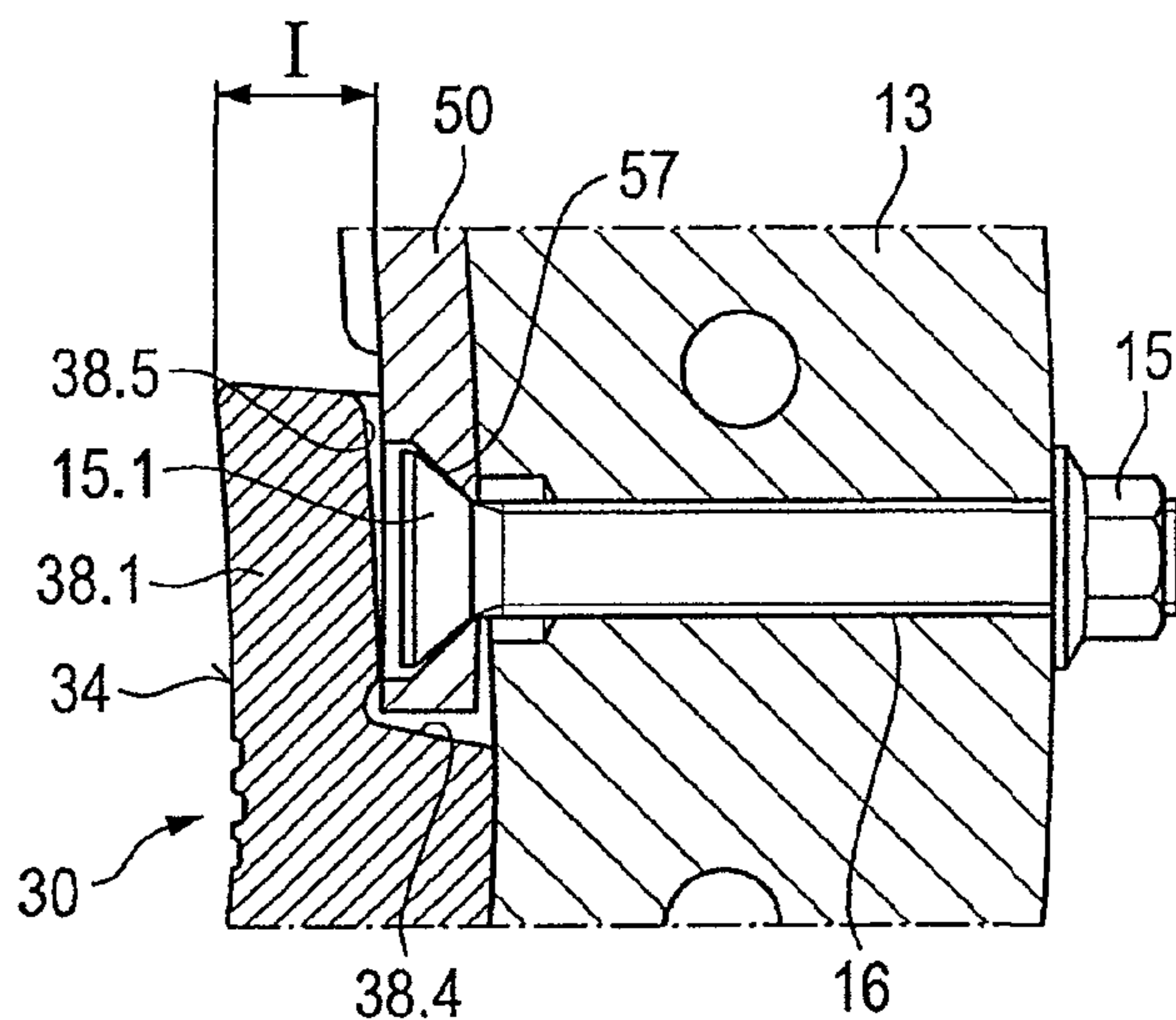




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 (54) Title: SHARE TIP AND TOOL COMBINATION HAVING A SHARE TIP



(57) **Abrégé/Abstract:**

The invention relates to a tool combination, comprising a share tip and an adjoining guide element, wherein the share tip and the guide element have threaded receptacles for fastening to a tine. An easy and secure fastening of both the share tip and the guide element is achieved according to the invention in that the guide element has a threaded receptacle which is covered in the tool advancement direction by means of a cover portion of the share tip.

ABSTRACT

The invention relates to a tool combination, comprising a share tip and an adjoining guide element, wherein the share tip and the guide element have threaded receptacles for fastening to a tine. An easy and secure fastening of both the share tip and the guide element is achieved according to the invention in that the guide element has a threaded receptacle which is covered in the tool advancement direction by means of a cover portion of the share tip.

Share Tip and Tool Combination Having a Share Tip

The invention relates to a share tip for an agricultural soil cultivating machine, having a base part that has a blade on a blade holder, the base part having a threaded opening for fastening to a support, in particular a tine of the agricultural soil cultivating machine.

The invention also relates to a tool combination having a share tip and a guide element attached thereto, the share tip and the guide element having threaded openings for fastening to a tine.

DE 10 2011 102 053 A1 discloses a tool combination having a share tip and a guide plate, which can be fastened together to a tine of a soil cultivating machine. At a blade end, the share tip has a blade holder, which is equipped with a blade element composed of hard metal. To the sides of the blade element, secondary blades are soldered to the blade holder at an angle. The blade holder has a threaded opening, which can be oriented so that it is flush with a threaded opening of the guide plate. The guide plate is placed onto the share tip and covers the areas of the surface adjacent to the blade and the secondary blades. In order to fasten the combination composed of the guide plate and share tip, a fastening screw is inserted from the front through the flush threaded openings of the guide plate and share tip and is screwed into a threaded opening of the tine. In harsh operating conditions and difficult ground conditions, the guide plate may be bent relative to the share tip and shorn off. This then constitutes a significant impairment to the functionality of the tool combination.

The object of the invention is to produce a share tip of the type mentioned at the beginning and a tool combination having a share tip, which makes it possible to securely fasten the guide element and the share tip to a tine or similar support of an agricultural soil cultivating machine and in which at least one securing element is protected from wear.

The object of the invention relating to the share tip is attained in that the base part has a recess, which is covered in the tool advancement direction by a covering section. The

guide element can thus be accommodated with its free end protected behind the covering section. The guide element and securing element (screw) in this region are thus protected from being struck by the soil material that is dug up by the share tip. In particular, the guide element then can no longer be bent or twisted at its free end relative to the share tip, thus assuring long-term functionality.

According to a preferred embodiment variant of the invention, it is possible for the recess to be open toward the back of the base part and for it to constitute an insertion socket from the side. The guide element is thus accommodated so that it is protected laterally as well and can be guided out of the recess region through the opening side.

According to a particularly preferred embodiment of the invention, a share tip can be embodied so that the recess has at least one locking piece to provide a form-fitting locking of a guide element perpendicular to the tool advancement direction. With the locking piece, it is possible to secure the guide element and share tip to each other perpendicular to the advancement direction, thus achieving a reduction in the required number of fasteners, in particular fastening screws.

In a particularly preferred embodiment, in the region of the recess, two locking pieces are used, which are spaced apart from each other perpendicular to the tool advancement direction. The guide element can then be enclosed between these two locking pieces.

A stable tool design is achieved if in the region of the covering section, two locking pieces are formed onto the back side of the base part and the locking pieces constitute support surfaces. The guide element can be exactly aligned with the support surfaces. Because the locking pieces protrude from the back of the base part, the recess can be easily produced. In particular, the share tip can then be produced as a forged part with a low tool cost.

A further stabilization of the locking pieces can be achieved if the recess has a connecting section, which connects the locking pieces to each other in integral fashion. This makes it possible to reliably carry away transverse forces.

To simplify assembly, it is possible for an insertion socket of the recess to be laterally bordered by insertion bevels that are spaced apart from each other. Then the share tip can be attached to the guide element in a simple way.

A share tip according to the invention can be embodied so that in front of the threaded opening in the tool advancement direction, a projection is provided, which protrudes up from a deflection surface of the share tip. The projection serves as a deflector for the soil material and guides it away from a screw head that is mounted in the threaded opening. The screw head is thus positioned in a way that protects it from wear.

The object of the invention is also attained with a tool combination in which the guide element has a threaded opening, which is covered by means of a covering section of the share tip. In this case, the covering section is positioned in front of the guide element in the tool advancement direction so that it can be accommodated there in a protected way. As already mentioned above, the guide element is thus protected from being struck by the soil material flowing past.

In one possible variant of the invention, one or more locking pieces lock the share tip and the guide element to each other in a form-fitting fashion perpendicular to the tool advancement direction. Preferably, the share tip in this case is equipped with only one threaded opening. It is thus possible to reduce the number of required fastening elements in connection with the form-fitting locking action. The share tip can be simply attached to a mounted guide element if, in the region of its end oriented toward the share tip, the guide element has an insertion projection that is inserted laterally into the recess.

The assembly is particularly simple if the insertion projection has two guide bevels that are arranged in a V shape relative to each other.

A further service life optimization for the guide element can be easily achieved if in the connecting region to the share tip, a hard material element is mounted on the guide element. The hard material element can, for example, be an armored layer, in particular a deposit weld, or it is conceivable to mount hard material elements made of hard metal or the like to the guide element.

The invention will be explained in greater detail below in conjunction with an exemplary embodiment shown in the drawings. In the drawings:

Fig. 1 is a perspective front view of a cultivator blade with a share tip and a guide element,

Fig. 2 is a side view of the depiction according to Fig. 1,

Fig. 3 is an enlarged depiction of a detail labeled III-III in Fig. 4,

Fig. 4 is an enlarged depiction of a detail labeled IV-IV in Fig. 2,

Fig. 5 is a perspective, detailed front view of the share tip of the cultivator blade according to Fig. 1, and

Fig. 6 is a perspective rear view of the share tip according to Fig. 5.

Fig. 1 shows a cultivator blade for installation on a tool holder, in particular a (tine) 10 or tine holder or plow beam or the like of an agricultural soil cultivating machine. The tine 10 has a fastening part 11, which has threaded openings 12 passing through it. By means of these threaded openings 12, the tine 10 can be mounted on a device support. As Fig. 2 also shows, on the side oriented away from the fastening part 11, the tine 10 has a

support piece 13. A share tip 30, a guide element 50, and two plow wings 20 can be mounted onto this support piece 13.

The plow wings 20 have a transverse support 21 to which blade elements 22 made of a hard material are fastened. Preferably, the blade elements 22 are made of a hard metal that is integrally joined to the transverse support 21, in particular soldered to it. The transverse support 21 has an angle piece 23 bent up from it, which is equipped with threaded openings. The plow wings 20 can be fastened to the tine 10 by means of fastening screws 14 that are inserted through the threaded openings of the angle piece 23 and the threaded openings of the support piece 13. The guide element 50 with the fastening part 11 is mounted above the plow wings 20. As shown in Figs. 1 and 2, the guide element 50 is composed of a sheet-like forged steel component. It is curved so that it forms a helical deflection surface. Sometimes, rectilinear deflection surfaces are also used. Hard material elements 56 in the form of a deposit weld are attached to this deflection surface. The guide element 50 also has a threaded opening 57 that is clearly visible in Fig. 1. A fastening screw can be inserted through this threaded opening 57. This fastening screw is guided through a threaded opening of the support piece 13 and secured by means of a nut. Fig. 1 shows that an arc-shaped hard material element 56, particularly in the form of a deposit weld or hard metal elements, is situated in front of the threaded opening 57 in the tool advancement direction V (tool advancement direction V, indicated in Fig. 2). This hard material element 56 serves as a deflector for soil flowing past. The screw head of the fastening screw 15, which is secured in sunken fashion in the threaded opening 57, is thus protected from the abrasive wear of the soil. As shown in Figs. 2 and 3, the guide element 15 is also fastened to the tine 10 by means of a second fastening element, in particular a fastening screw 15. The guide element 50 has another threaded opening 16 for this purpose. This threaded opening 16 is situated flush with a threaded opening 57 of the support piece 13 of the tine 10. A fastening screw 15 can be inserted through the flush threaded openings 57 and 16 and secured at the back with a nut. The two fastening elements 15 thus securely attach the guide element 50 at two fixing points. As shown by Fig. 3, the fastening elements 15 embodied in the form of fastening screws are equipped with a screw head 15.1. The geometric

embodiment of the screw head 15.1 and the threaded opening 57 is such that the screw head 15.1 is either essentially flush with the surface of the front of the guide element 50 or is accommodated in a recessed fashion. This is clearly shown in Fig. 3.

Fig. 4 also shows that the threaded opening 57 is provided in an insertion projection 51 of the guide element 50. The insertion projection 51 has two guide bevels 54 that are arranged in a V shape relative to each other. They transition into side pieces 52. The side pieces 52 are situated in the region of an end 53 of the insertion projection 51.

In order to complete the cultivator blade, a share tip 30 is mounted to the tine 10. The design of the share tip 30 is shown in greater detail in Figs. 5 and 6. As these drawings show, the share tip 30 has a base part 31 through which a threaded opening 33 passes. An identification field 32 is provided above the threaded opening 33. Below the threaded opening 33, there is a projection 34.1, which in the form of a deflector, protrudes up from the front deflection surface 34 of the base part 31. In this way, the projection 34.1 constitutes an apron that protects a screw head situated in the threaded opening 33 from the abrasive action of the soil flowing past. In front of the projection 34.1 in the advancement direction, the base part 31 has steps 35 that protrude up from the deflection surface 34. In the present exemplary embodiment, the steps 35 are rib-shaped and oriented perpendicular to the tool advancement direction. There are hollows 36 between the individual steps 35. During use of the tool, soil can be compressed into the region of the hollows 36 and accumulate there. This forms a kind of natural wear protection on the deflection surface 34. In front of the steps 35 in the tool advancement direction, the base part 31 has a blade holder 37. Blade elements 40 in the form of hard metal elements are fastened to the blade holder 37. The blade elements 40 have a sheet-like fastening section 40.1 and formed onto the latter, a shoulder 40.2 protruding away from the tool advancement direction V. A blade 40.3 is produced in the region of the shoulder 40.2. The blade elements 40 are fastened to the blade holder 37 so that the free terminal edge of the blade holder 37 is at least partially enclosed by the shoulders 40.2 of the blade elements 40, as is clearly shown Fig. 2 and also Fig. 6. This protects the free end of the blade holder 37 from wear. Behind the blade elements 40 in

the advancement direction, hard material elements 21 are mounted onto the edge regions of the base part 31 that are subjected to particularly intense wear. In the present case, hard material elements 41 embodied in the form of hard metal plates are soldered to the base part 31. It is also conceivable, however, to use an armored weld or the like.

Fig. 6 shows a rear view of the share tip 30. As is clear from this depiction, projections 39 are formed onto the base part 31 in the region above the blade holder 37. The projections 39 are embodied in the form of ribs and are situated in the region of the longitudinal edges of the base part 31. The projections 39 are spaced apart from each other so that a slot 39.1 is formed between the projections 39. At the end oriented away from the blade holder 37, the share tip 30 has a recess 38. The recess 38 is formed in a pocket shape into the back of the share tip 38. It has a covering section 38.1. The covering section 38.1 is adjoined at the sides by insertion bevels 38.2 in the form of wall elements. The wall elements in this case are arranged in a V shape relative to each other. Locking pieces 38.3 are situated in the region below the insertion bevels 38.2. The locking pieces 38.3 are spaced apart from each other and are likewise composed of wall elements that rise up from the covering section 38.1. The two locking pieces 38.3 are integrally joined to each other by means of a bottom 38.4 of the recess 38.

In order to assemble the share tip 30, its recess 38 is slid onto the insertion projection 51 of the guide element 50. As is shown in Fig. 4, in this joining motion, the insertion projection 51 of the guide element 50 can be threaded into the insertion bevels 38.2, thus enabling a precise assembly. After the insertion projection 51 has passed the insertion bevels 38.2, the end 53 of the insertion projection 51 slides between the two locking pieces 38.3. In this case, the dimensional association is selected so that the locking pieces 38.3 are laterally associated with the side pieces 52. As a result, the share tip, taking into account a design-required minimal play, is fixed against the locking pieces 38.3 in a form-fitting fashion perpendicular to the tool advancement direction. In order to provide a definite seat in this case, the bottom 38.4 and the end 53 of the insertion projection 51 are spaced apart from each other (see play S in Fig. 4). The

insertion bevels 38.2 are also situated so that they are spaced slightly apart from the guide bevels 54 (see play S in Fig. 4).

After the recess 38 of the share tip 30 has been affixed to the insertion projection 51 of the guide element 50, the threaded opening 33 of the share tip 30 is situated flush with a threaded opening of the tine 10. Then a fastening screw can be inserted through the flush threaded openings and the share tip 30 can be affixed to the tine 10 with only one fastening screw. The rotationally secured association of the share tip 30 with the tine 10 is thus ensured by means of the form-fitting locking action between the insertion projection 51 and the recess 38.

In the assembled state, the share tip 30 protrudes up from the surface of the guide element 50 in the region of the recess 38 with its deflection surface 34 that ends there. As shown in Fig. 3, this produces a shoulder with a protrusion T. This protrusion T once again serves as a deflector, which deflects soil away from the screw head, which is secured in the threaded opening 57 (see Fig. 1). In order to be able to reliably fulfil this function, the spacing dimension T should be at least 8 mm. An optimal wear protection is achieved with a protrusion > 12 mm.

Claims

1. A share tip (30) for an agricultural soil cultivating machine, having a base part (31), which has a blade (40.3), the base part (31) having a threaded opening (33) on a blade holder (37) for fastening to a support, in particular a tine (10) of the agricultural soil cultivating machine,
characterized in that
the base part (31) has a recess (38), which is covered in the tool advancement direction (V) by means of a covering section (38.1).
2. The share tip according to claim 1,
characterized in that
the recess (38) is open toward the back of the base part (31) and constitutes an insertion socket from the side.
3. The share tip according to claim 1 or 2,
characterized in that
the recess (38) has at least one locking piece (38.3) to provide a form-fitting locking of a guide element (50) perpendicular to the tool advancement direction.
4. The share tip according to claim 3,
characterized in that
the recess has two locking pieces (38.3) that are spaced apart from each other perpendicular to the tool advancement direction.
5. The share tip according to claim 3,
characterized in that
in the region of the covering section (38.1), two locking pieces (38.3) are formed onto the back side of the base part (31),
and the locking pieces (38.3) constitute support surfaces.
6. The share tip according to any one of claims 3 through 5,
characterized in that
the recess (38) has a connecting section (38.4), which integrally connects the locking pieces (38.3) to each other.

7. The share tip according to any one of claims 1 through 6,
characterized in that
an insertion socket of the recess is laterally bordered by insertion bevels (38.2) that
are spaced apart from each other.
8. The share tip according to any one of claims 1 through 7,
characterized in that
in front of the threaded opening (33) in the tool advancement direction (V) a
projection (34.1) is provided, which protrudes up from a deflection surface (34).
9. A tool combination having a share tip (30) and a guide element (50) attached
thereto, the share tip (30) and the guide element (50) having threaded openings (33,
57) for fastening to a tine (10),
characterized in that
the guide element (50) has a threaded opening (57), which is covered in the tool
advancement direction (V) by means of a covering section (38.1) of the share tip
(30).
10. The tool combination according to claim 9,
characterized in that
one or more locking pieces (38.3) lock the share tip (30) and the guide element (50)
to each other in a form-fitting fashion perpendicular to the tool advancement
direction (V).
11. The tool combination according to claim 9 or 10,
characterized in that
the share tip (30) is equipped with a threaded opening (33).
12. The tool combination according to any one of claims 9 through 11,
characterized in that
in the region of its end oriented toward the share tip (30), the guide element (50)
has an insertion projection (51) that is inserted into the recess (38) laterally.
13. The tool combination according to claim 12,
characterized in that

the insertion projection (51) has two guide bevels (54) that are arranged in a V shape relative to each other.

14. The tool combination according to any one of claims 9 through 13, characterized in that
in the connecting region to the share tip (30), the guide element (50) is provided with a hard material element (56), in particular an armored layer or the like.
15. The tool combination according to any one of claims 9 through 14, including the share tip (30) according to any one of claims 1 through 8.

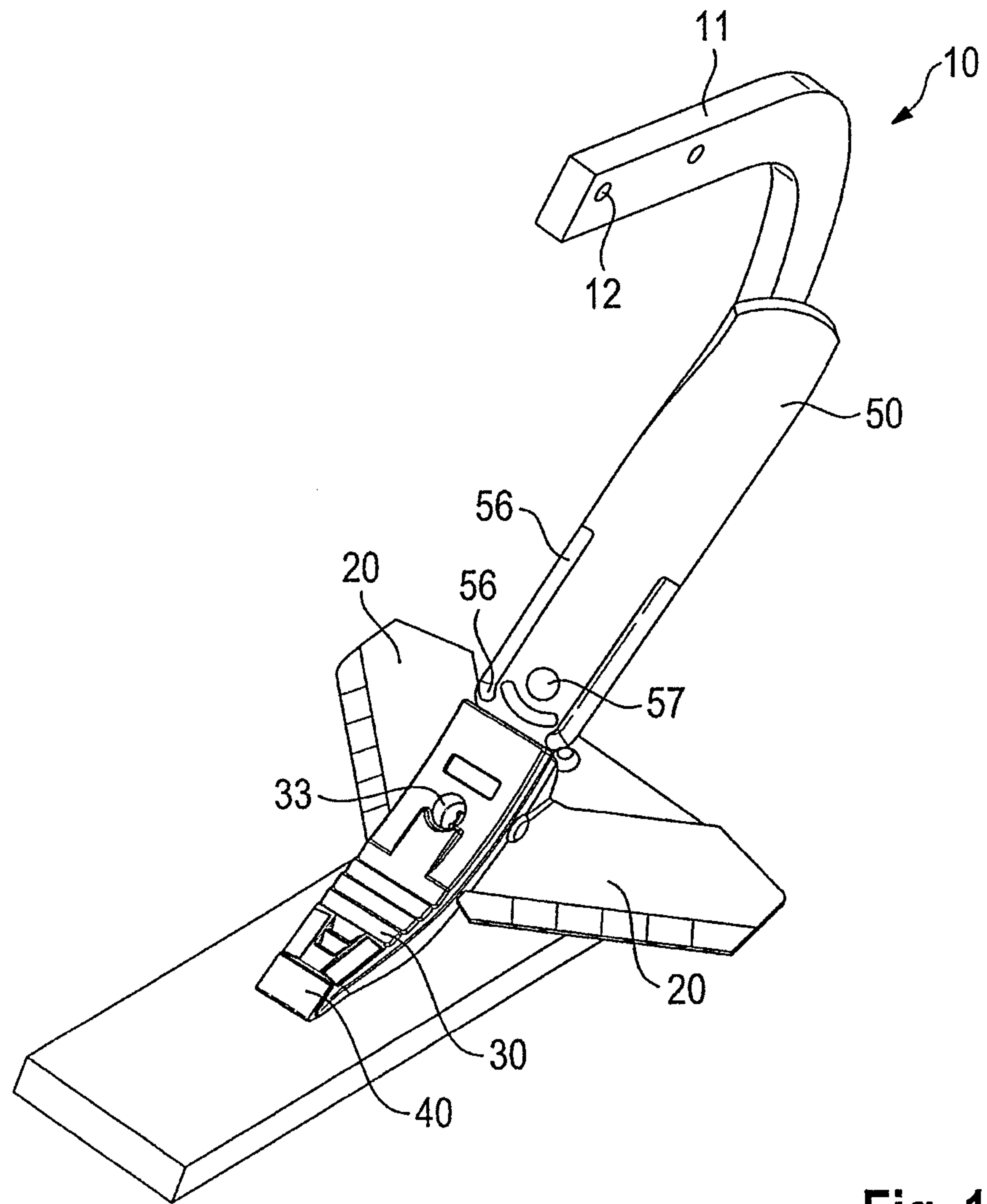


Fig. 1

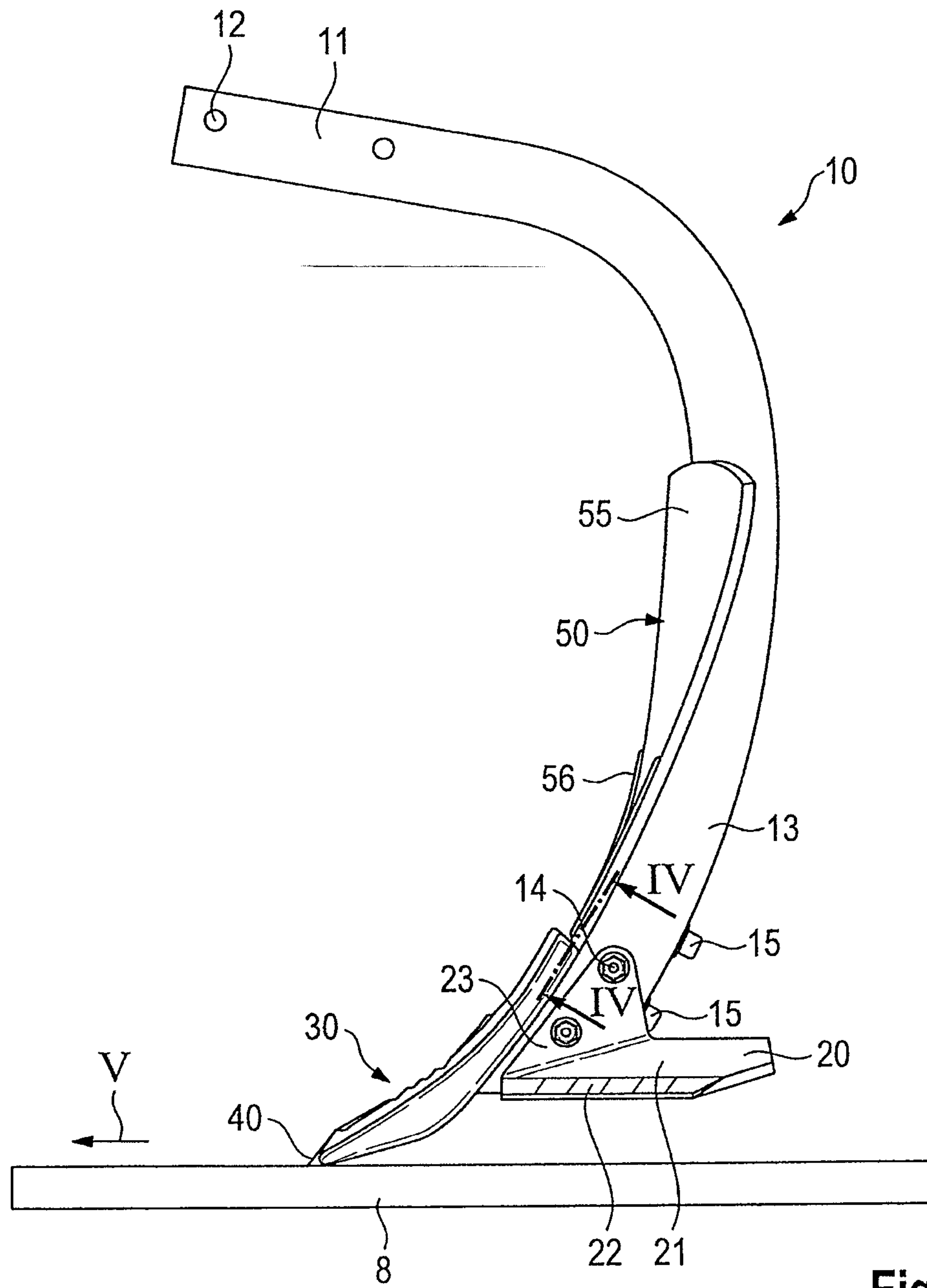


Fig. 2

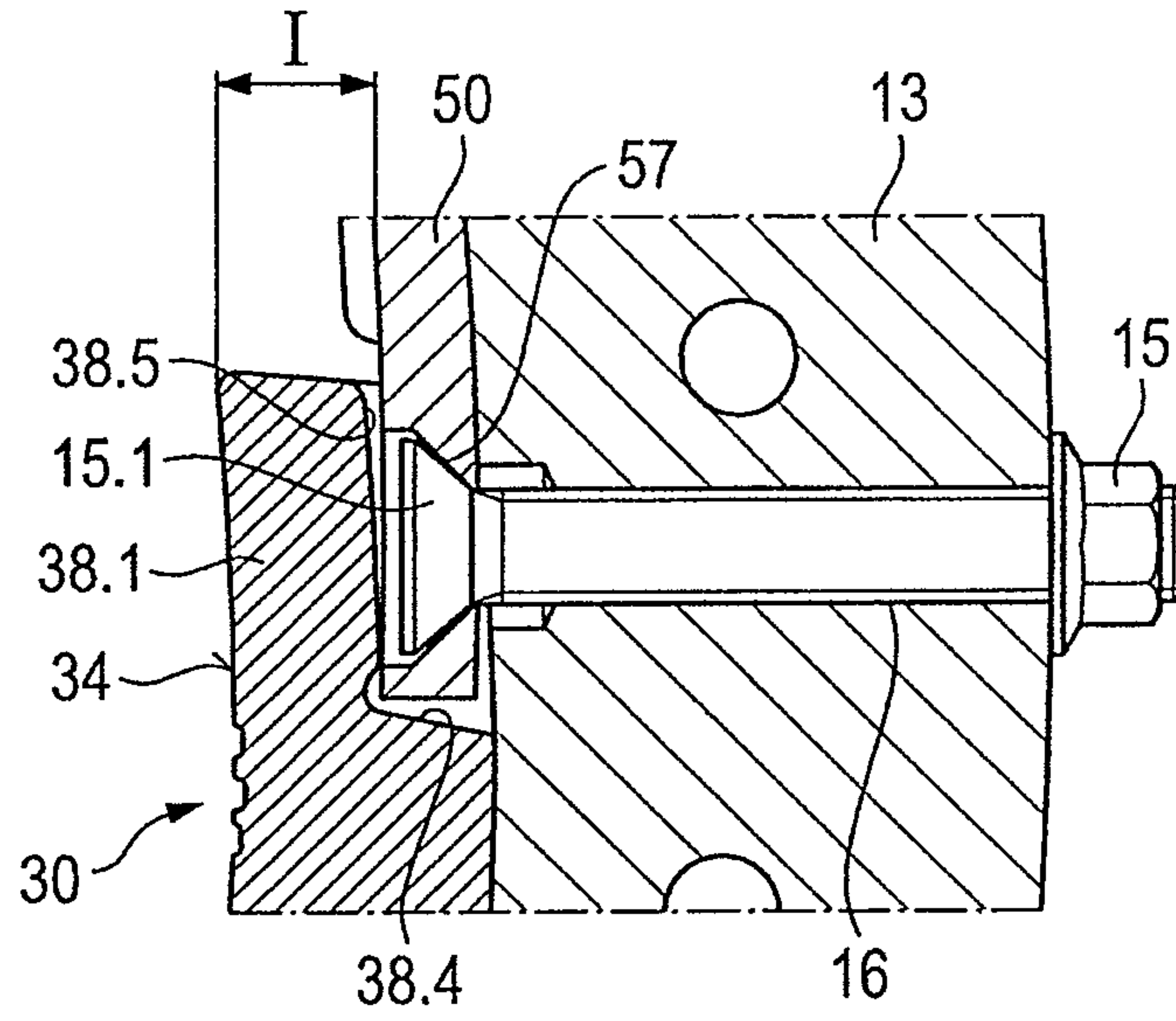


Fig. 3

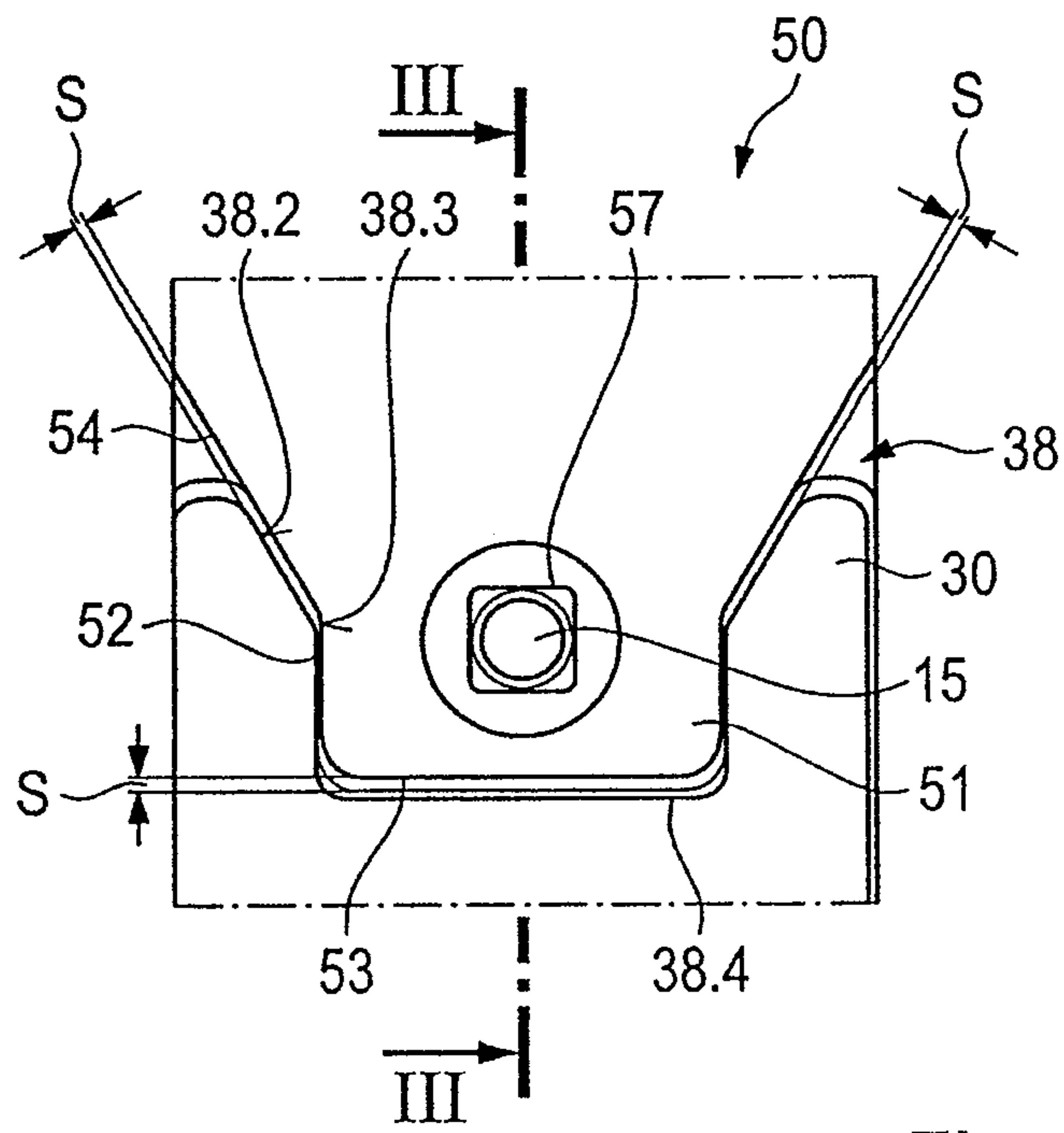


Fig. 4

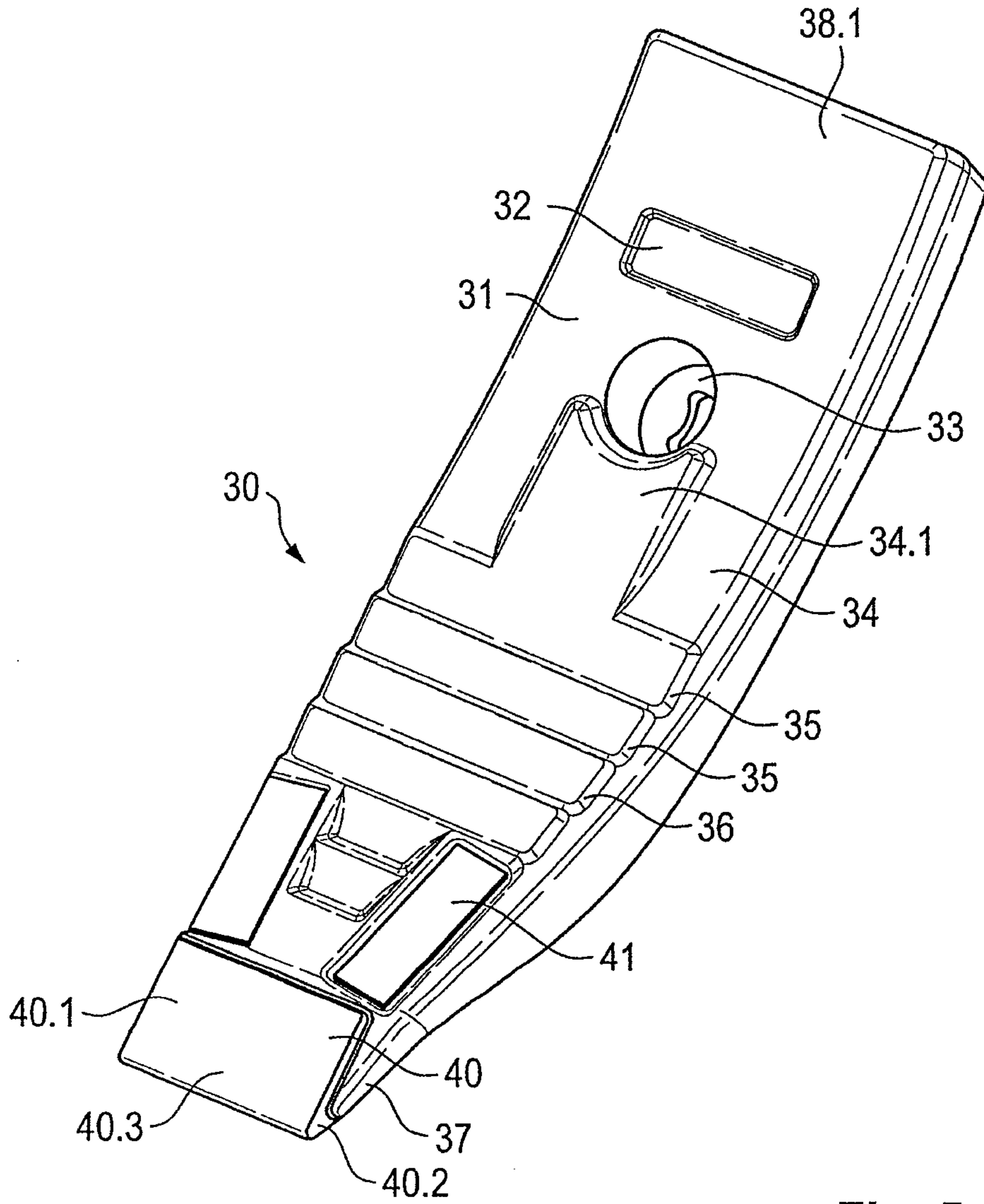


Fig. 5

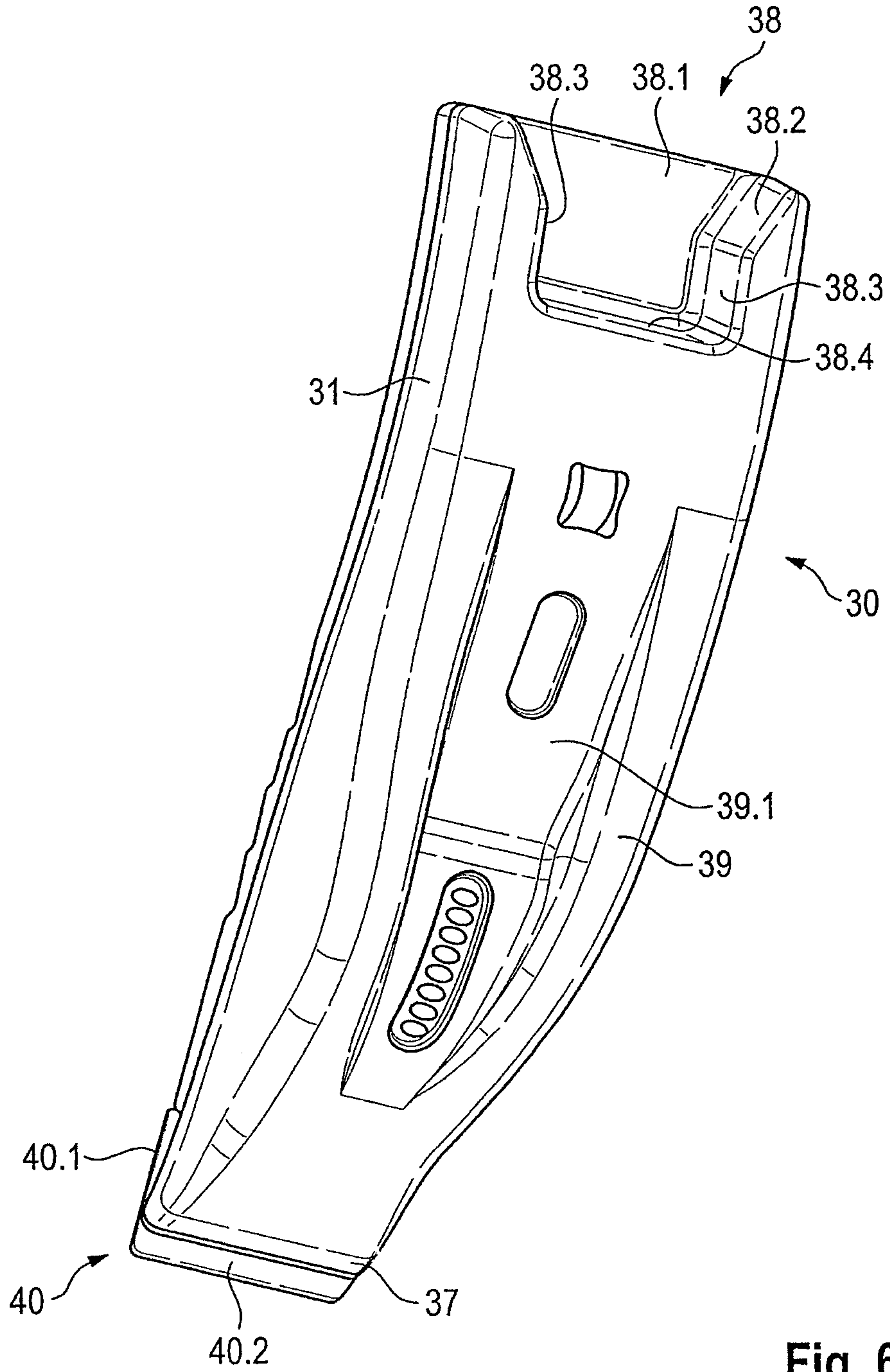


Fig. 6

