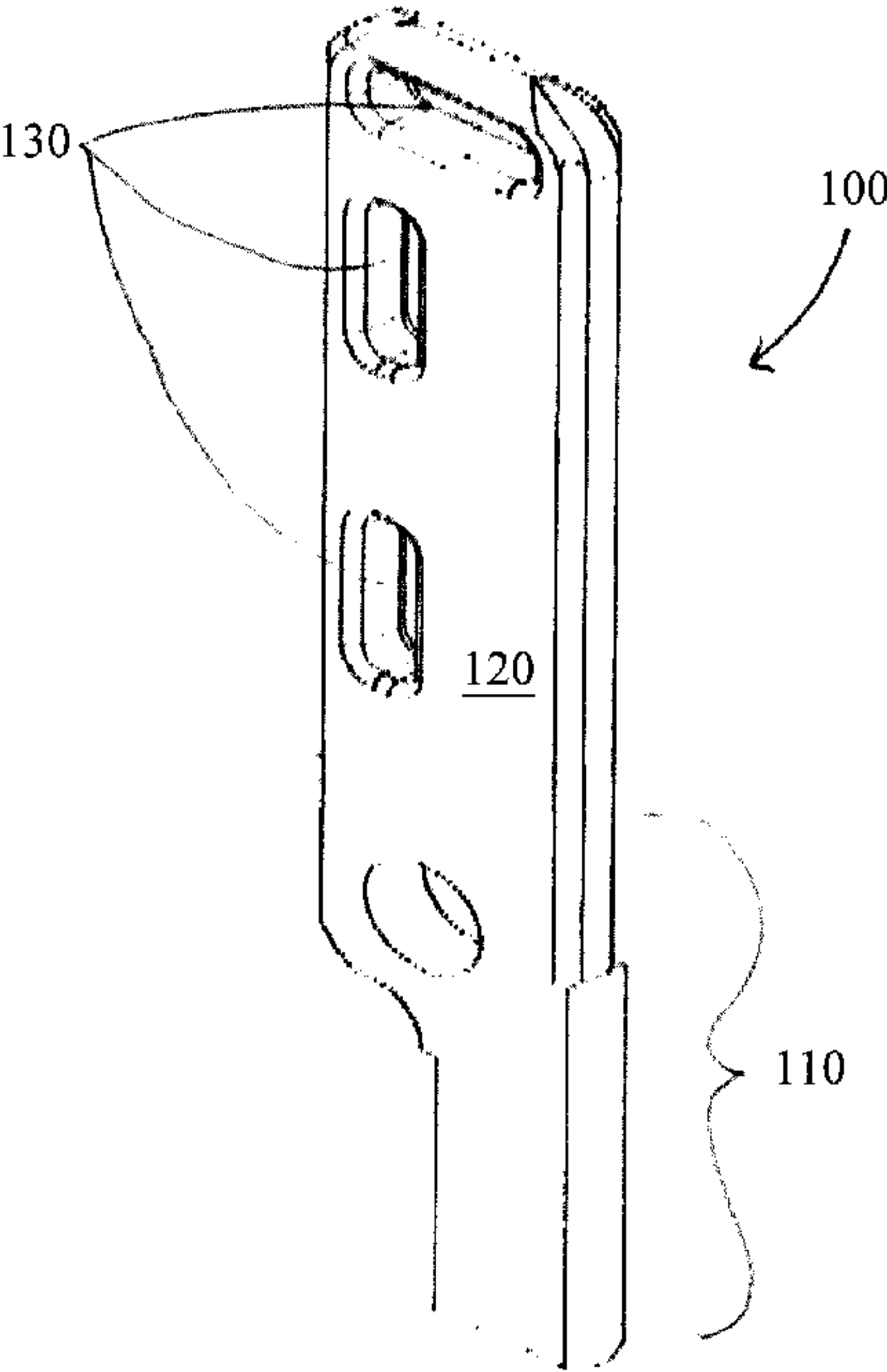




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(54) Titre : POIGNEE DE SAISIE DESTINEE A UNE MACHINE DE TRAVAIL DU SOL
(54) Title: GRAB HANDLE FOR USE WITH AN EARTH-WORKING MACHINE



(57) **Abrégé/Abstract:**
A grab handle for attachment to an earth-working machine is described. The grab handle is of solid metal or alloy construction so as to be durable and reliable for safety purposes in high-impact environments, and can be installed adjacent continuous track of a crawler-type vehicle. The grab handle includes an attachment portion adapted for connection to the earth-working machine, and at least one grab aperture.

ABSTRACT

A grab handle for attachment to an earth-working machine is described. The grab handle is of solid metal or alloy construction so as to be durable and reliable for safety purposes in high-impact environments, and can be installed adjacent continuous track of a crawler-type vehicle. The grab handle includes an attachment portion adapted for connection to the earth-working machine, and at least one grab aperture.

GRAB HANDLE FOR USE WITH AN EARTH-WORKING MACHINE

TECHNICAL FIELD

[0001] The following relates to earth-working machines, and more particularly to a grab handle for attachment to an earth-working machine to facilitate safe access and egress by an operator.

BACKGROUND

[0002] Earth-working machines are operated under high-impact, unstable surface conditions, and the machine and working implements are therefore required to be of sound and robust construction. Operator safety is the highest priority in the design and operation of such machines, and all safety features are routinely inspected during use. The largest of the earth-working machines, such as track or crawler type vehicles mobile on continuous track, including dozers, excavators, and shovels, can be poorly equipped to facilitate safe access to and egress from the vehicle. When safety features such as ladders and handles are provided near ground access surfaces on such vehicles, they are not suitably impact-resistant to provide safe and reliable support adjacent continuous track of a crawler-type vehicle. Accordingly, ladders and handles are routinely damaged upon impact with obstacles such as excavated earth, boulders, and other environmental hazards, comprising these safety features. The largest of the track or crawler-type earth-working machines typically operate in the highest impact environments, and a higher standard of durability and safety is required.

SUMMARY

[0003] In accordance with a first aspect, there is provided a grab handle for attachment to an earth-working machine, the grab handle comprising a solid, elongated body having an attachment portion adapted for connection to the earth-working machine and at least one grab aperture formed within the solid, elongated body and spaced from the attachment portion.

[0004] In an implementation, the attachment portion comprises an attachment aperture for connection to an implement mounting location on the earth-working machine.

[0005] In a further implementation, the earth-working machine is a crawler-type vehicle mobile on a continuous track, and the implement mounting location is in proximity to the continuous track.

[0006] In one implementation, the implement mounting location comprises a pair of spaced apart parallel mounting plates with axially aligned apertures, and wherein the attachment portion of the grab handle body is of a size and shape suitable for engagement between parallel plates of the implement mounting location such that the attachment aperture of the grab handle is aligned with the axially aligned apertures in the parallel plates for connection thereto with a pin.

[0007] In an implementation, the attachment portion of the grab handle body is adapted for connection to the earth-working machine in proximity to an access or egress surface of the earth-working machine.

[0008] In another implementation, the attachment portion of the grab handle is adapted for connection to the earth-working machine by welding.

[0009] In an implementation, the earth-working machine is a dozer and the implement mounting location is a tilt cylinder mount on a push arm of the dozer.

[0010] In an implementation, the solid, elongated body of the grab handle is composed of cast metal or steel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Various aspects and implementations will now be described by way of example only with reference to the appended drawings wherein:

[0012] FIG. 1 is a perspective view of a grab handle, in one implementation;

[0013] FIG. 2 is a photograph of a track dozer with attached grab handle, in one implementation; and

[0014] FIG. 3 is a perspective view of a grab handle in proximity to a push arm of a track dozer, in one implementation.

DETAILED DESCRIPTION

[0015] A grab handle is provided for attachment to an earth-working vehicle, such as a dozer, excavator, or track shovel, for use in assisting a vehicle operator in safe access to and egress from the vehicle. The grab handle is of solid construction so as to be durable and reliable in high-impact environments, such as those in which track or crawler vehicles typically operate. The grab handle is formed with an attachment portion that is adapted for secure connection to the earth-working machine, and includes a grab aperture spaced from the attachment portion that is suitable to be grasped by an operator during vehicle access or egress. The grab handle is particularly useful when installed in high-impact locations adjacent steps, stairs, ladders, or ledges used to access the continuous track surface of crawler-type vehicles from the ground.

[0016] With reference to Figure 1, an implementation of a grab handle 100 is provided. The grab handle 100 has an elongated body 120 of solid metal, an attachment portion 110 adapted for connection to a dozer, and grab apertures 130 of suitable size for grasping by a vehicle operator. The grab apertures 130 can be located in any suitable position on the body 120, based on the need for access or support to improve safety of an operator in moving about the vehicle. Given the robust and impact-resistant structure of the grab handle, installation of the grab 100 handle adjacent a continuous track of an earth-working vehicle improves safety and reliability in operator access to the vehicle.

[0017] The grab apertures 130 may be of any suitable size or shape, and other features may also be present on the body or associated with the grasping apertures 130, such as grooves, ridges, or other features to assist in grasping by an operator. When considering the placement of grab apertures 130 on the body 120, the structural integrity of the body 120 should be considered. That is, a sufficient amount of solid metal should form the body 120 and surround the apertures 130 to resist damage from repeated heavy impact with the environment during operation of the dozer.

[0018] The attachment portion 110 of the grab handle 100 is adapted for attachment to an implement mounting location on the dozer. In the implementation shown, the attachment portion 110 of the grab handle 100 is adapted for attachment to a tilt cylinder mount on a push arm of a dozer. Adaptations to other locations and other

vehicles will be readily apparent and can be designed as necessary based on the type of vehicle and desired points of access to the vehicle surfaces.

[0019] With reference to Figure 2, a grab handle 250 is installed on track dozer 200, which bears a dozer blade 210 mounted on push arm 220. The grab handle 250 is located in proximity to access ledges 221 on the push arm 220, as the access ledges 221 are used as steps by an operator when climbing aboard or disembarking from the vehicle. As the push arm is generally located adjacent to the continuous track, the ledges are designed to be impact resistant. However, as railings and handles on earth-working vehicles are typically formed of metal or alloy tubing, in some applications, such railings and handles are not suitably impact-resistant and can fail over time.

[0020] The push arm 220 is mounted to the side frame 221 of the dozer 200 so as to be pivotable about a push arm mount 222 such that the dozer blade can be raised or lowered as the push arm pivots about mount 222. When the push arm 220 is lowered to the ground, the dozer blade 210 is driven and supported by push arm 220, and the cutting angle of the dozer blade 210 can be actuated by operation of tilt cylinder 230. When the push arm 220 is raised from the ground, the dozer blade 210 can carry and dump a load of earth or other material, actuated by operation of the tilt cylinder 230. Accordingly, coordinated operation of the push arm and tilt cylinder can actuate the dozer blade between various positions and orientations such as a dozing position, carrying/lifting position, and dumping position.

[0021] The tilt cylinder 230 is attached to an upper portion of the dozer blade at a first end, and the opposing end of the tilt cylinder is mounted to the push arm 220 at tilt cylinder mount 240. In the implementation shown, tilt cylinder mount 240 includes both a lower 241 and an upper 242 mounting location for the tilt arm 230. In operation, only one of the mounting locations is used, and the other remains open. Attachment of the tilt arm 230 to the lower mounting location 241 maximizes the range of motion for the dozer blade. That is, a lower tilt arm mounting location allows a greater downward tilt of the blade (a deeper cutting angle) during dozing when the push arm is lowered to the ground and the tilt arm is fully extended, and allows a greater carry volume when the push arm is raised from the ground and the tilt arm is fully retracted. When the lower tilt arm mount 241 is used to attach the tilt arm 230 to the push arm 220, the upper mounting location 242 is available for attachment of grab handle 250. When the upper tilt

arm mount 242 is used to attach the tilt arm 230 to the push arm 220, or, on vehicles where an upper mount is not present, the grab handle can be adapted for attachment to the vehicle by other means.

[0022] With reference to Figure 3, a grab handle 350 is depicted in proximity to a push arm 300. In the implementation shown, the beam 301 of the push arm 300 supports tilt arm mount 302, which consists of two parallel plates extending from the push arm. Each plate of the tilt arm mount 302 bears two mounting apertures, 307 and 308, with each aperture axially aligned with a corresponding aperture on the opposing parallel plate. The grab handle is installed between the parallel plates of the tilt arm mount 302, with the lower edge 352 of the grab handle body resting on the beam 301 of the push arm 300, and the attachment aperture 351 of the grab handle 350 aligned with the upper mounting apertures 308 of the parallel plates. The grab handle can be connected to the push arm by installation of a pin through the aligned apertures, which can be held in place using a retainer or lock, by welding, or using another suitable retention system. Attachment to an existing implement mounting location of the earth-working vehicle allows the handle to be installed, adjusted, or replaced by the operator if necessary, without need for a maintenance technician or welder to be present.

[0023] Once installed, the grab handle 350 is securely connected to the push arm, which bears ledges 310 that can be used by an operator as steps when climbing onto or down from the vehicle. An operator can thereby board or disembark the vehicle safely, using the ledges and grab handle to maintain a minimum of two, and preferable three, points of contact with the ground or vehicle.

[0024] In the implementation shown in the figures, the body of the grab handle is shaped so as to avoid interference with the installation and operation of a tilt arm within lower tilt arm mount 207. The grab handle may be cast or machined from solid metal of suitable thickness and durability for the intended environment. For example, cast steel, aluminum, other metals, or alloys may be formed into a suitable shape, having a thickness from about 1 to about 4 inches.

[0025] The grab handle may alternatively be designed, machined, formed, or otherwise manufactured and secured in any suitable position on the dozer by welding or other suitable locking or retention mechanisms, and the shape and size of the grab handle can be altered as needed for installation in such locations. The grab handle can

be installed adjacent any surface to which an operator or maintenance technician may require access to improve safety. The robust structure of the grab handle described above is well-suited for use adjacent a continuous track, due to the high-impact environment in which crawler vehicles typically operate. The grab handle can be formed with chamfered, smoothed edges, particularly around the circumference of the apertures, to provide a smooth, safe surface for an operator to grasp the grab handle.

[0026] The grab handle can be attached to any suitable location, adjacent or in place of any implement, whether an operational implement, earth-working implement, safety implement or otherwise. For example, the grab handle may be installed adjacent or in place of a tilt arm, step, ledge, ladder, rope, chain, earth-contacting implement, support beam, wheel, track, window, or actuator.

[0027] Likewise, the grab handles described herein have been depicted and described with reference to installation on a track dozer, however similar grab handles can also be used on other earth-working vehicles or heavy machinery. For example, installation of grab handles on an excavator may be carried out by installation on a side frame rather than a push arm.

[0028] For simplicity and clarity of illustration, specific details are set forth above in order to provide an understanding of the implementations described herein. However, it will be understood by those of ordinary skill in the art that the examples described herein may be practiced without these specific details. In other instances, well-known methods, procedures and components have not been described in detail so as not to obscure the examples described herein. Also, the description is not to be considered as limiting the scope of the examples described herein.

[0029] Although the above principles have been described with reference to certain specific examples, various modifications thereof will be apparent to those skilled in the art as outlined in the appended claims.

CLAIMS:

1. A grab handle for external attachment to an earth-working machine, the grab handle comprising a solid and elongated unitary body forming an attachment portion adapted for connection to the earth-working machine and at least one grab aperture formed within the solid and elongated unitary body and spaced from the attachment portion.
2. The grab handle as in claim 1, wherein the attachment portion comprises an attachment aperture for connection to an implement mounting location on the earth-working machine.
3. The grab handle as in claim 2, wherein the earth-working machine is a crawler-type vehicle mobile on a continuous track, and the implement mounting location is in proximity to the continuous track.
4. The grab handle as in claim 2, wherein the implement mounting location comprises a pair of spaced apart parallel mounting plates with axially aligned apertures, and wherein the attachment portion of the grab handle body is of a size and shape suitable for engagement between parallel plates of the implement mounting location such that the attachment aperture of the grab handle is aligned with the axially aligned apertures in the parallel plates for connection thereto with a pin.
5. The grab handle as in any one of claims 1 through 3, wherein the attachment portion of the grab handle body is adapted for connection to the earth-working machine in proximity to an access or egress surface of the earth-working machine.
6. The grab handle as in any one of claims 1 through 4, wherein the attachment portion of the grab handle is adapted for connection to the earth-working machine by welding.
7. The grab handle as in any one of claims 2 through 4, wherein the earth-working machine is a dozer and the implement mounting location is a tilt cylinder mount on a push arm of the dozer.
8. The grab handle as in any one of claims 1 through 5, wherein the solid and elongated unitary body is composed of cast metal or steel.

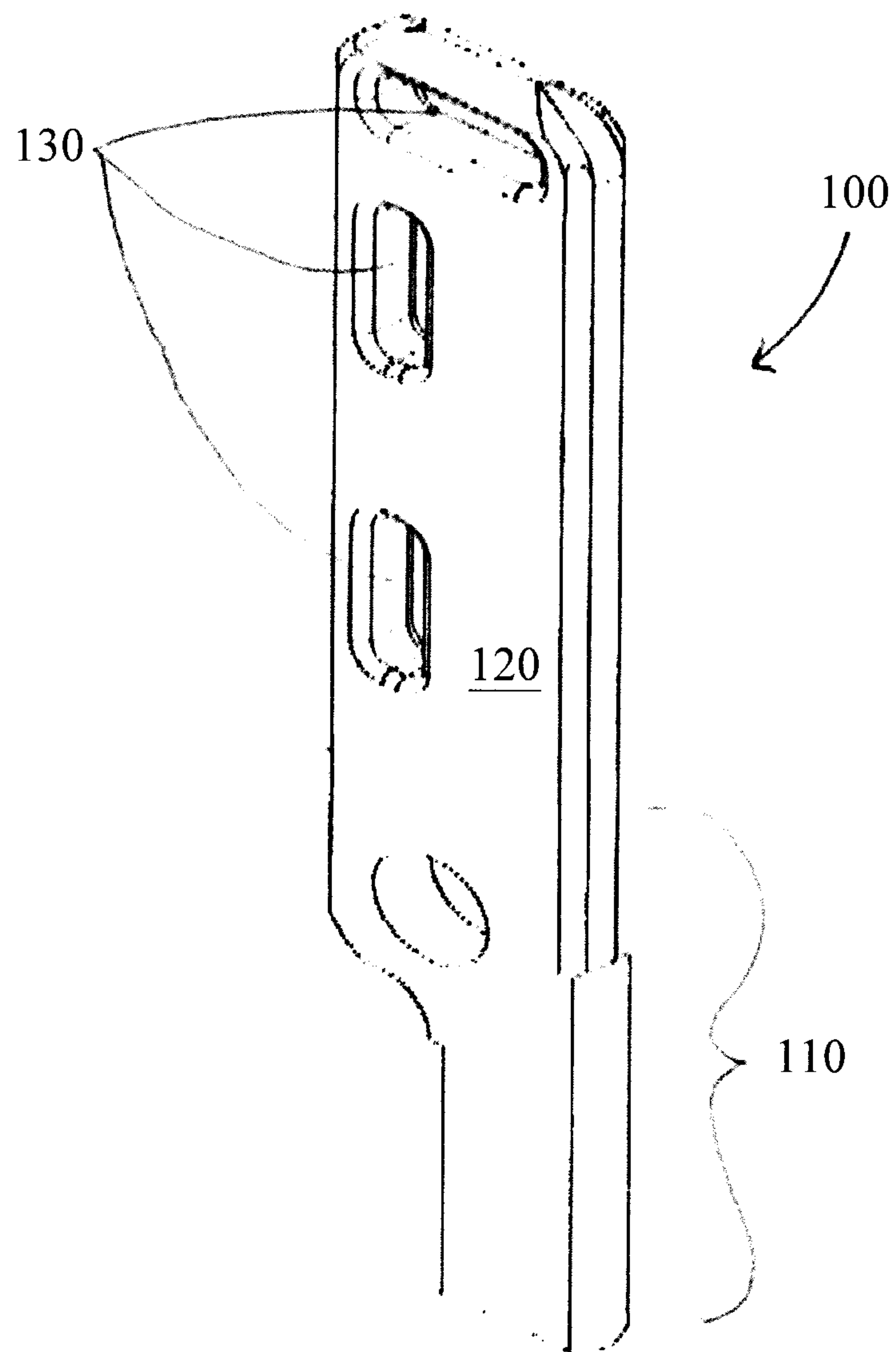
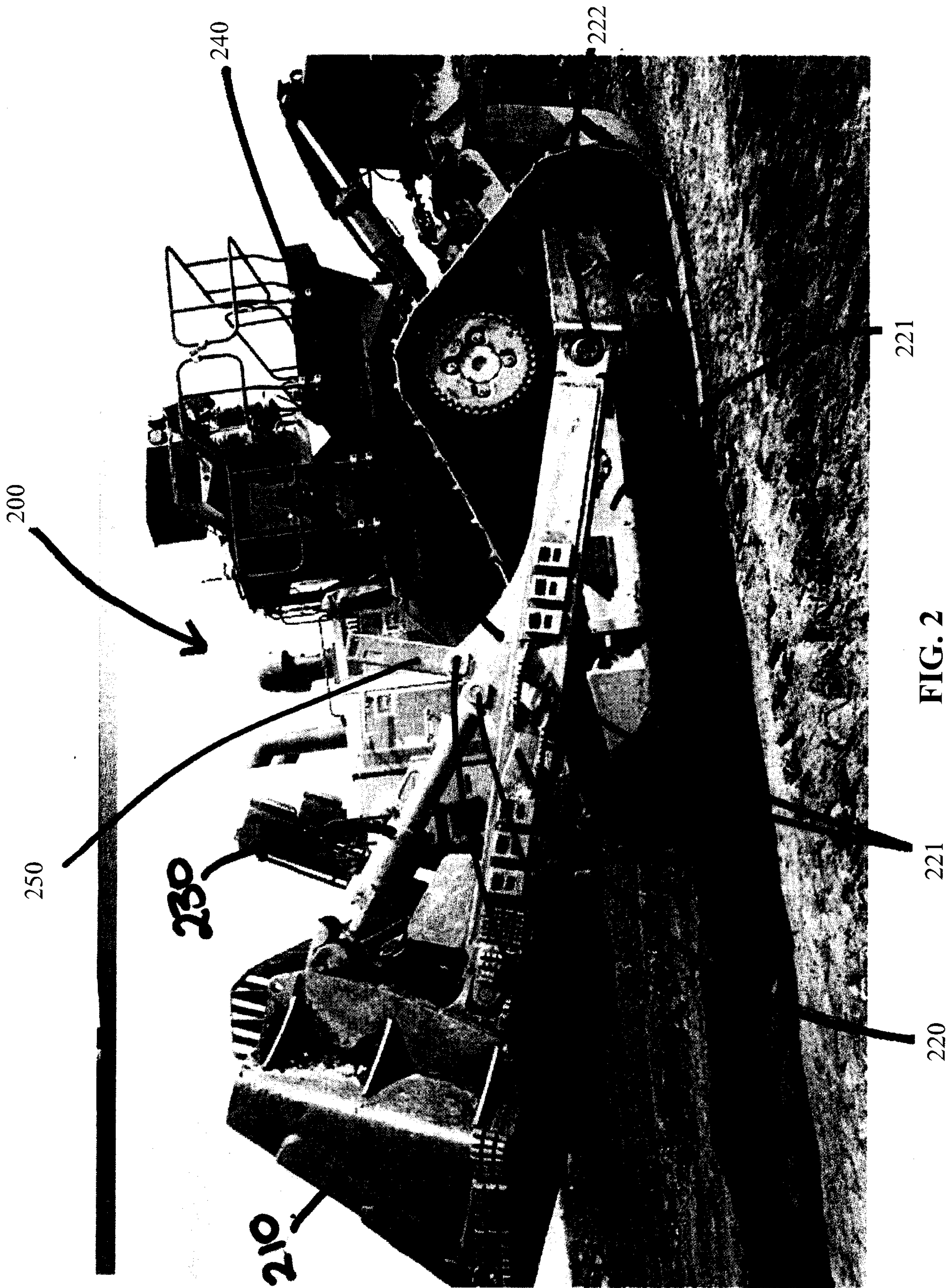


FIG. 1



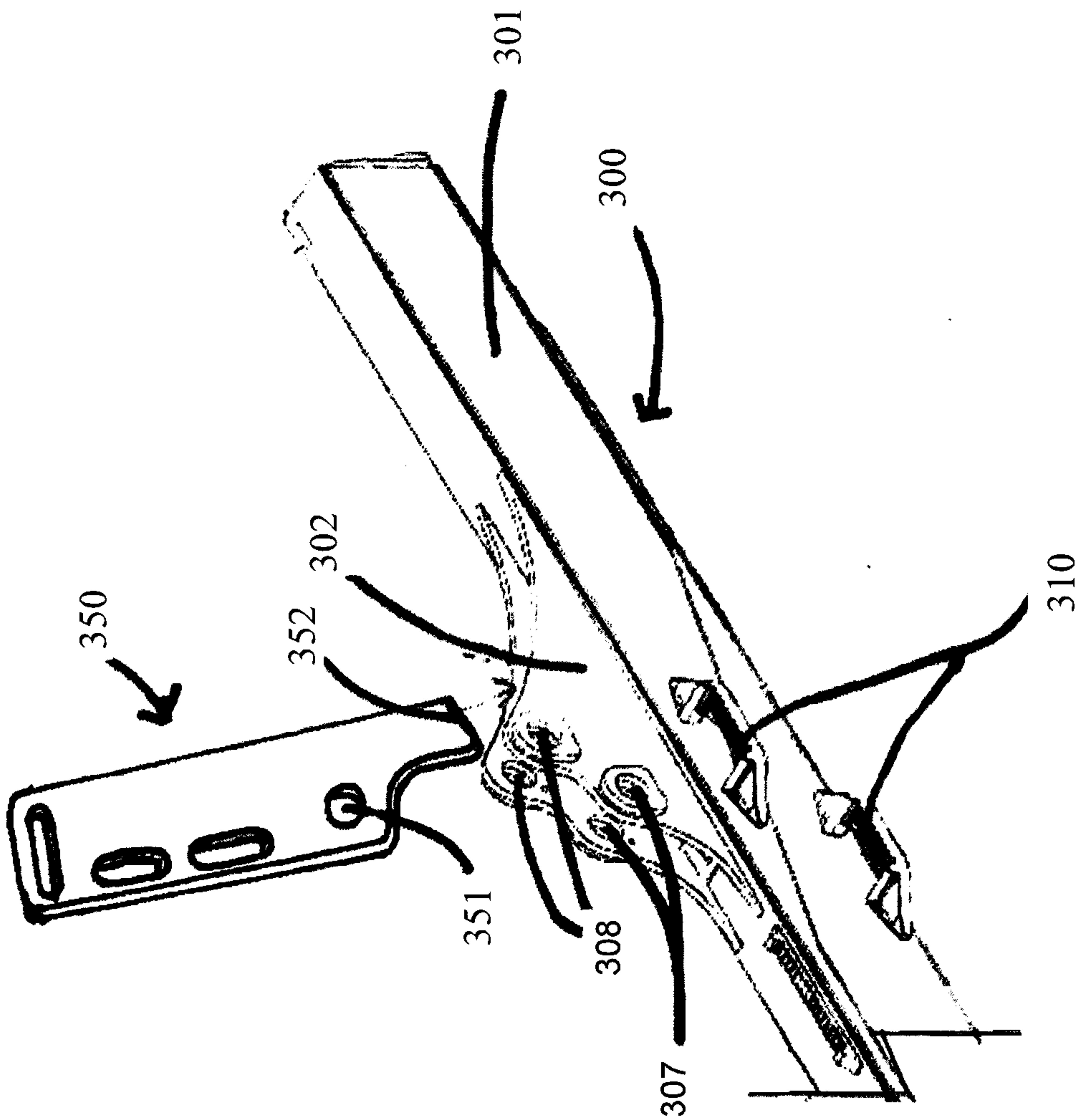


FIG. 3

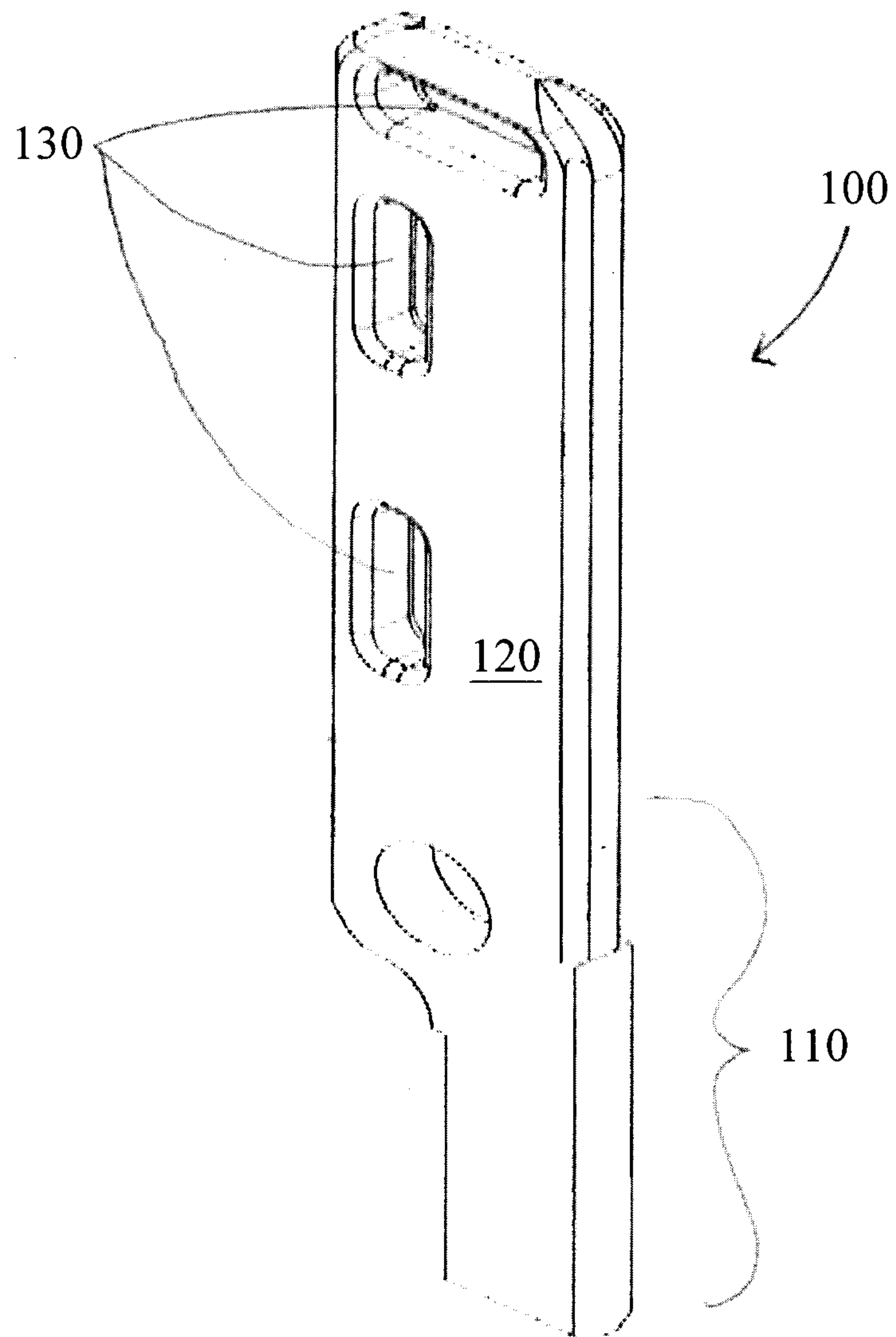


FIG. 1

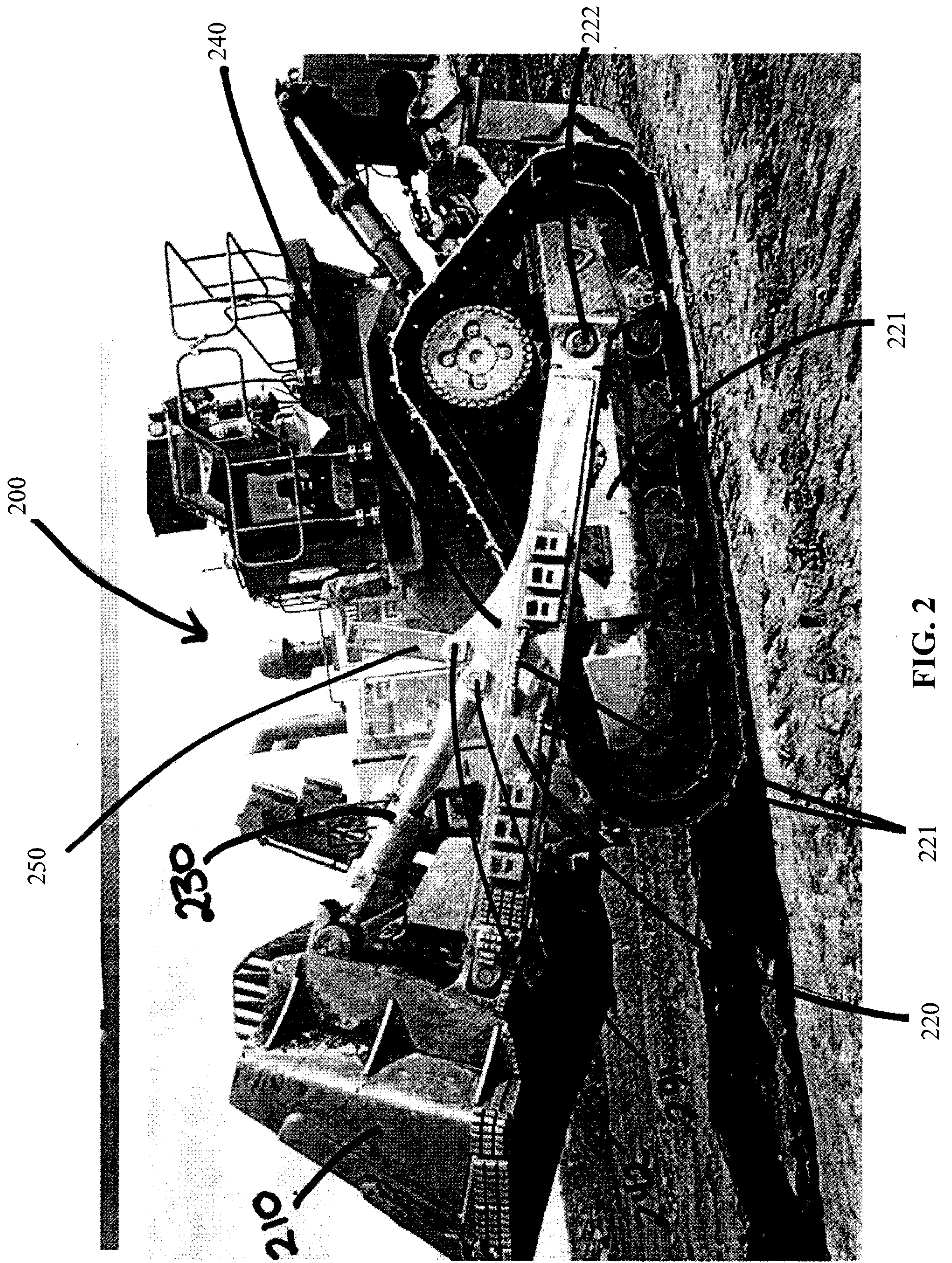


FIG. 2

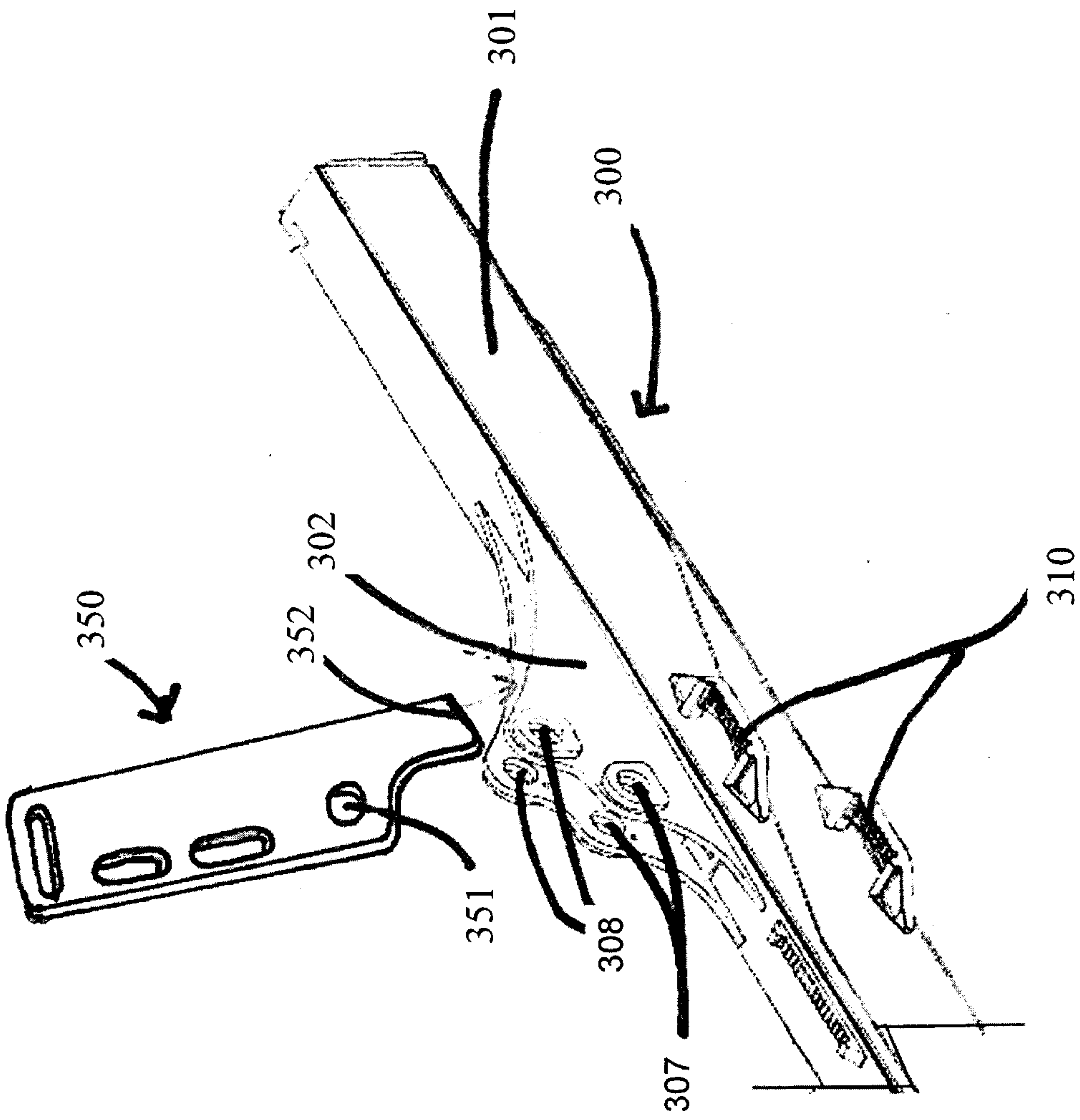


FIG. 3

