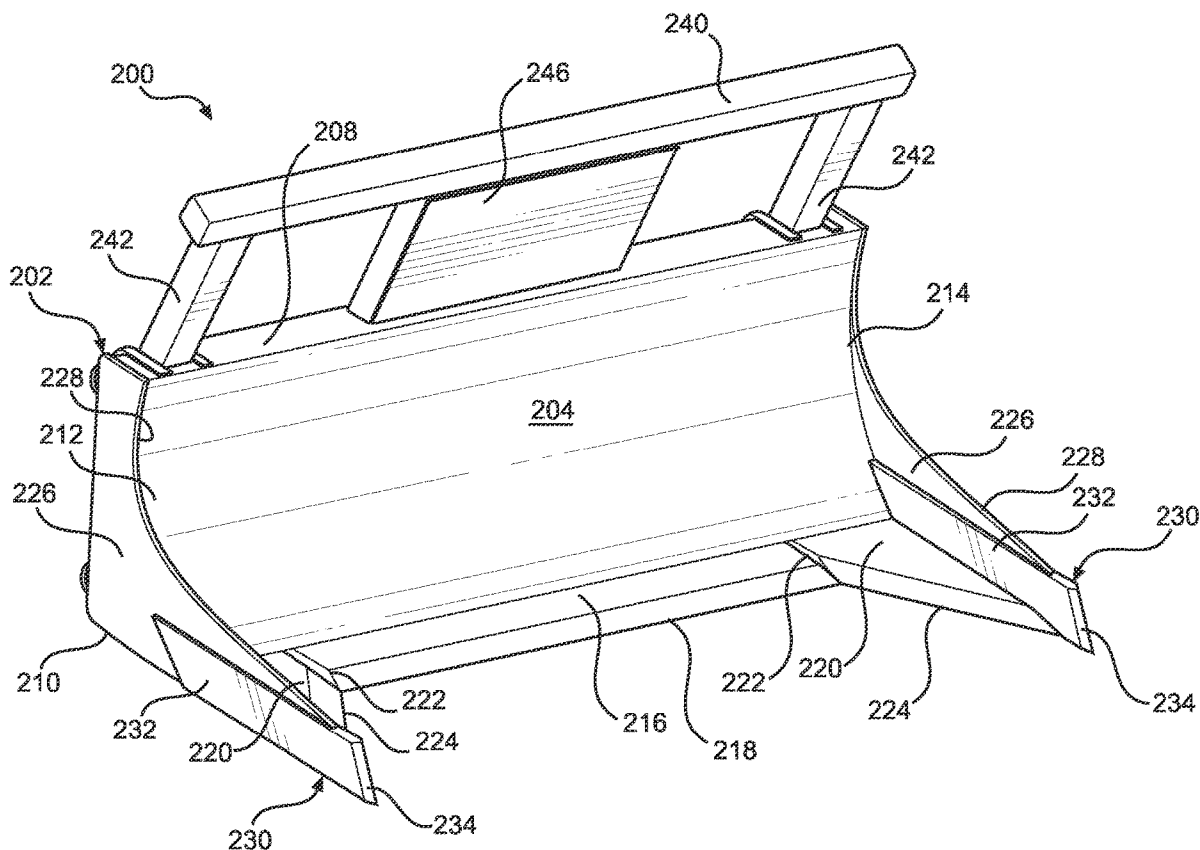




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(19) **United States**(12) **Patent Application Publication**
Garner et al.(10) **Pub. No.: US 2023/0052798 A1**(43) **Pub. Date: Feb. 16, 2023**(54) **LAND CLEARING BLADE FOR A MACHINE**(52) **U.S. Cl.**CPC **E02F 3/815** (2013.01)(71) Applicant: **Ken Garner Manufacturing, Inc.**,
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Paul Pruett, Chattanooga, TN (US)(73) Assignee: **Ken Garner Manufacturing, Inc.**,
Chattanooga, TN (US)(21) Appl. No.: **17/820,034**(22) Filed: **Aug. 16, 2022****Related U.S. Application Data**(60) Provisional application No. 63/233,356, filed on Aug.
16, 2021.**Publication Classification**(51) **Int. Cl.**
E02F 3/815 (2006.01)(57) **ABSTRACT**

A clearing blade adapted to be attached to a machine. The clearing blade includes a moldboard having a curved structure, a pair of stingers extending forwardly of the moldboard and arranged in a spaced apart arrangement from opposing lateral ends of the clearing blade. Each stinger includes a penetration portion adapted to penetrate and form a vertical cut. The clearing blade further includes a center blade arranged centrally to the moldboard, and an angled side blade extending inwardly from each of the pair of stingers towards the center blade. Each angled side blade is arranged in a substantially horizontal plane and is arranged at an obtuse angle relative to the center blade. Moreover, the clearing blade includes a plurality of attachment members such as, for example, a plurality of trunnion balls for engaging the clearing blade with the machine.



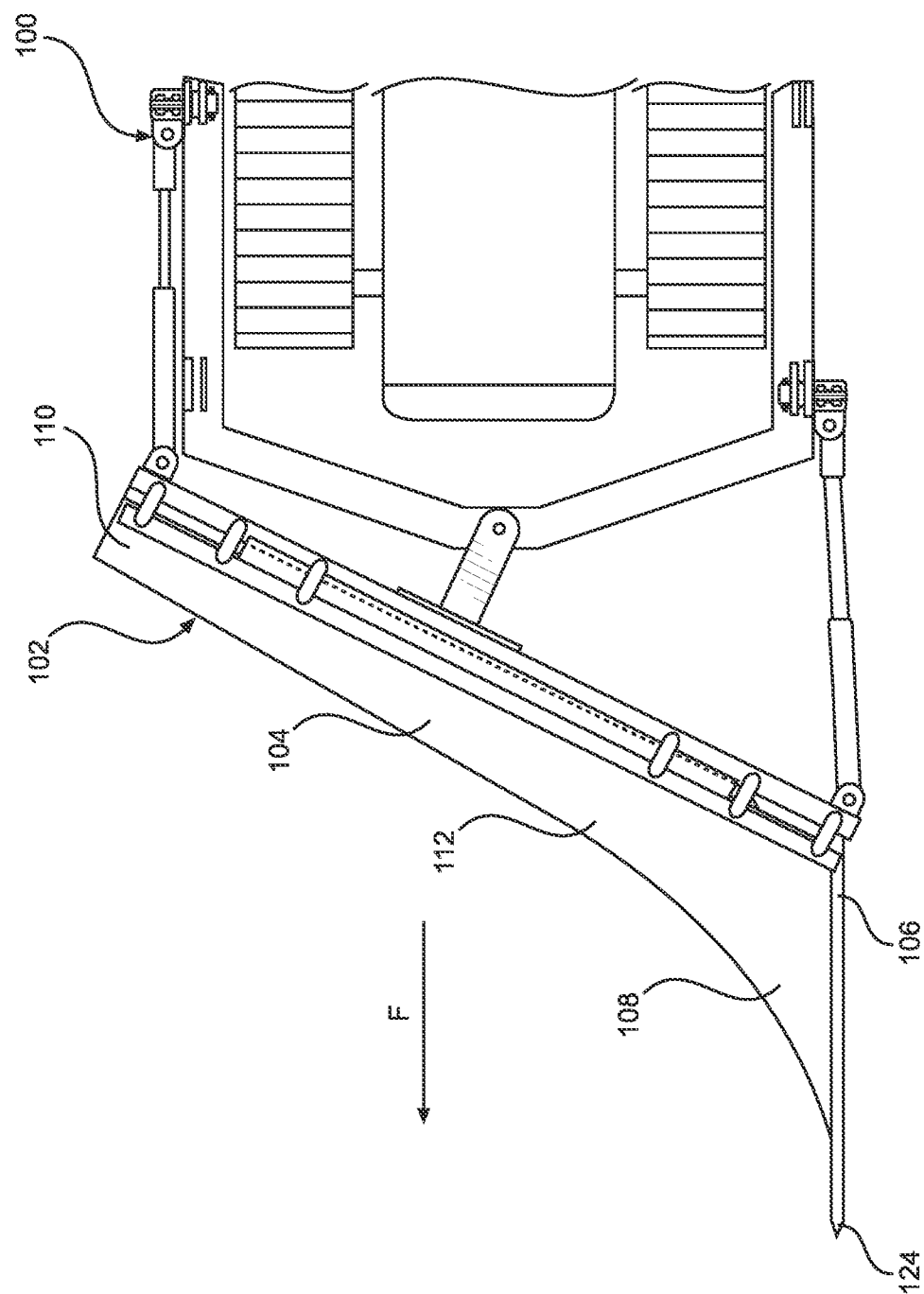


FIG. 1
(Prior Art)

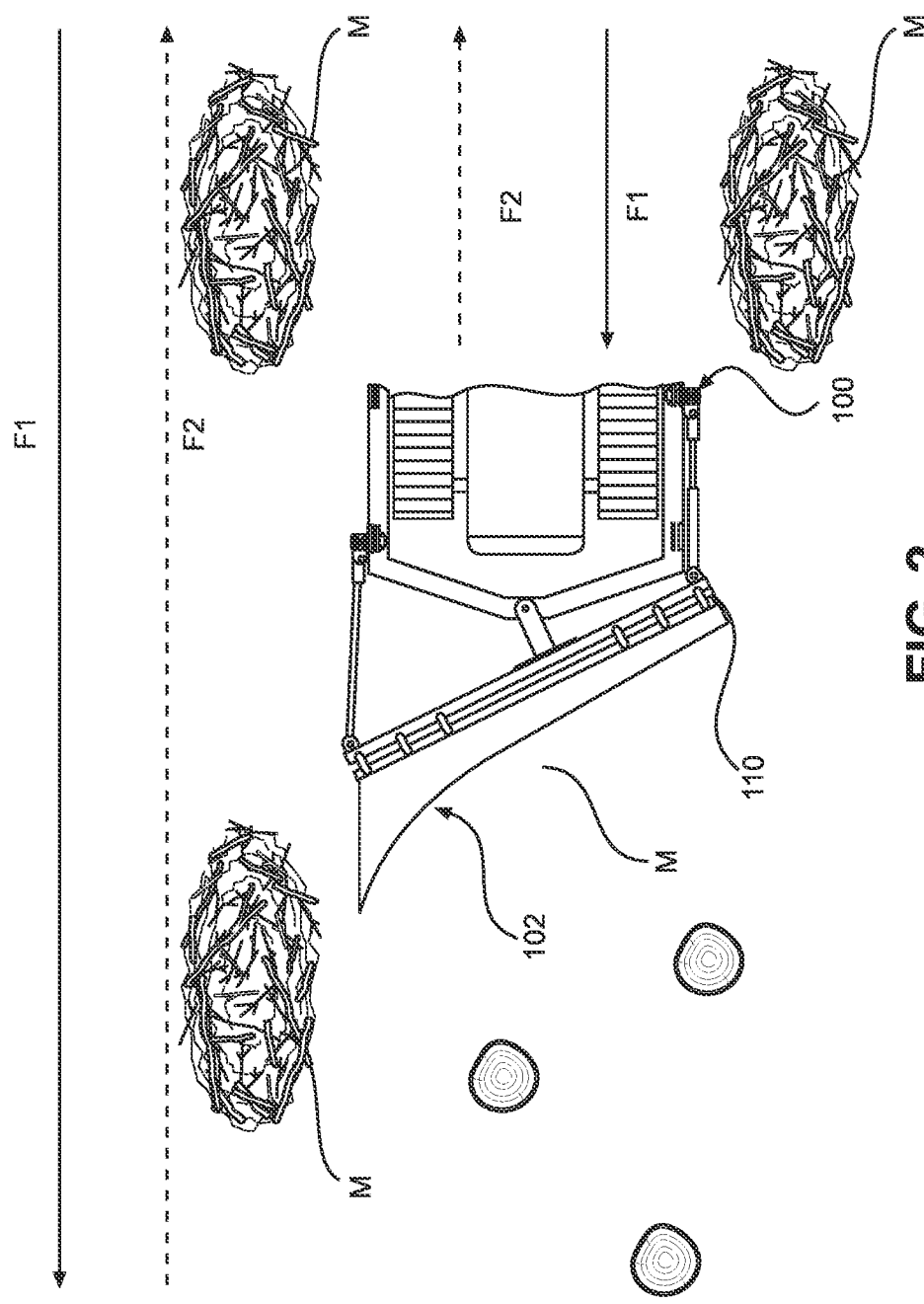


FIG. 2
(Prior Art)

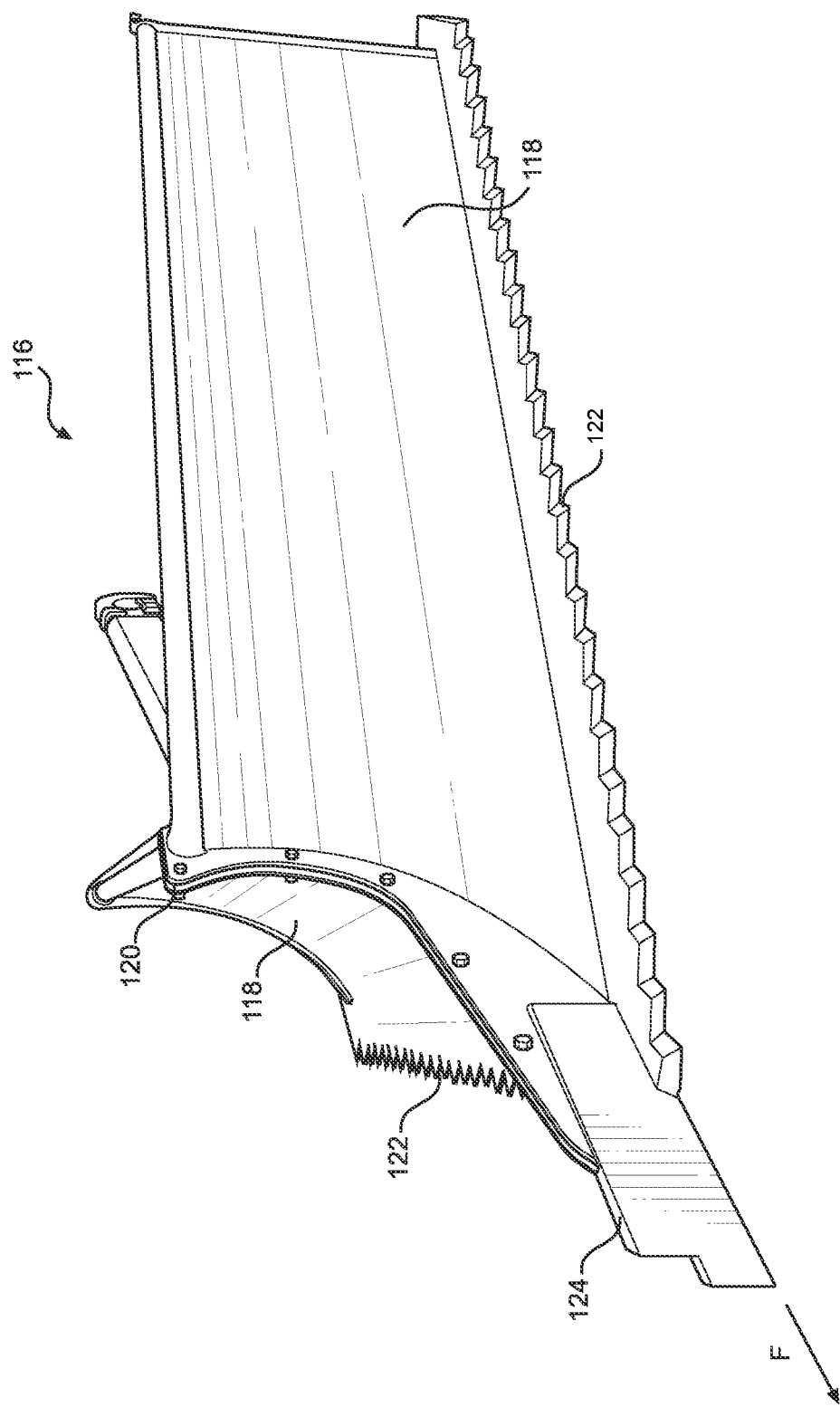


FIG. 3
(Prior Art)

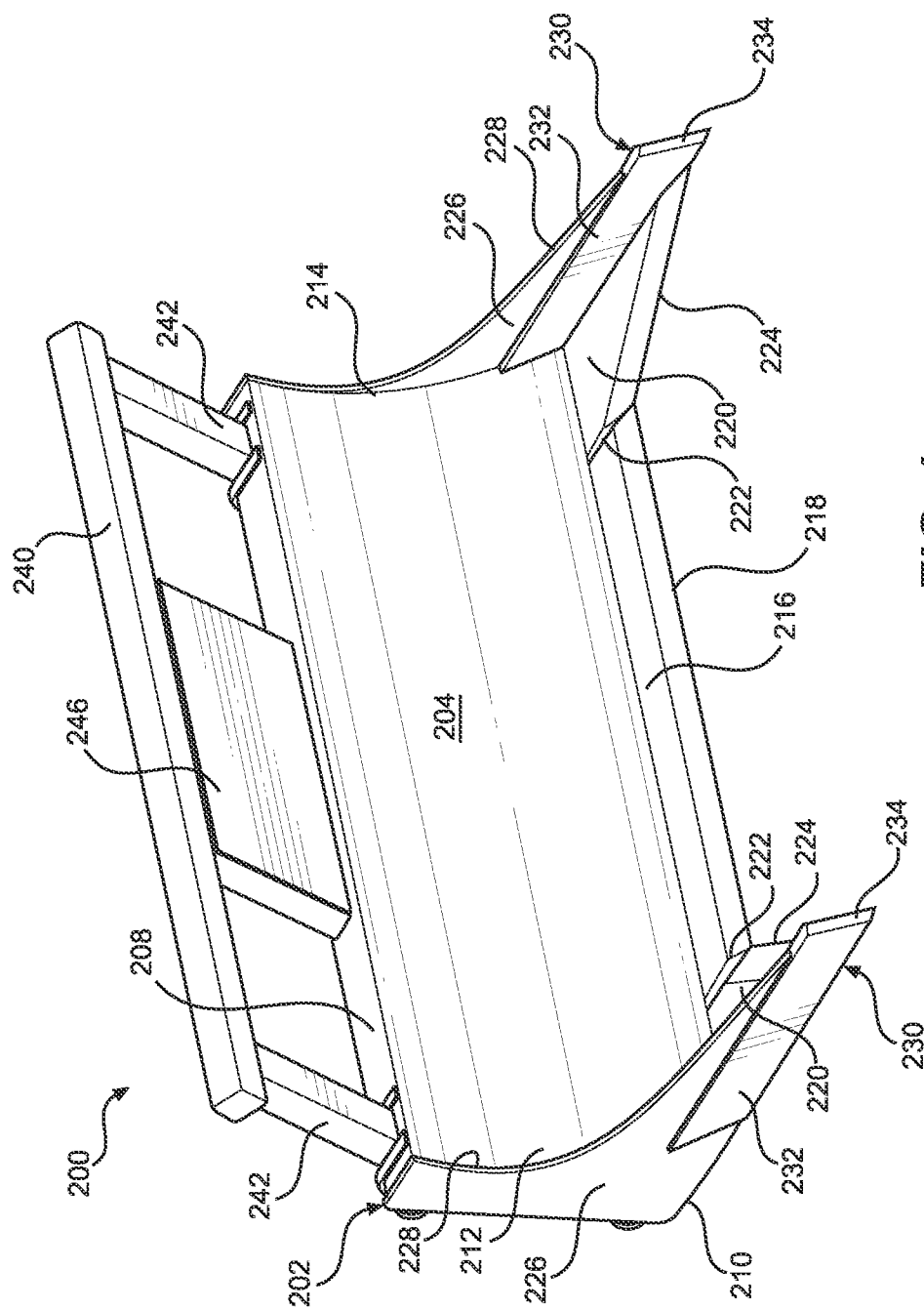


FIG. 4

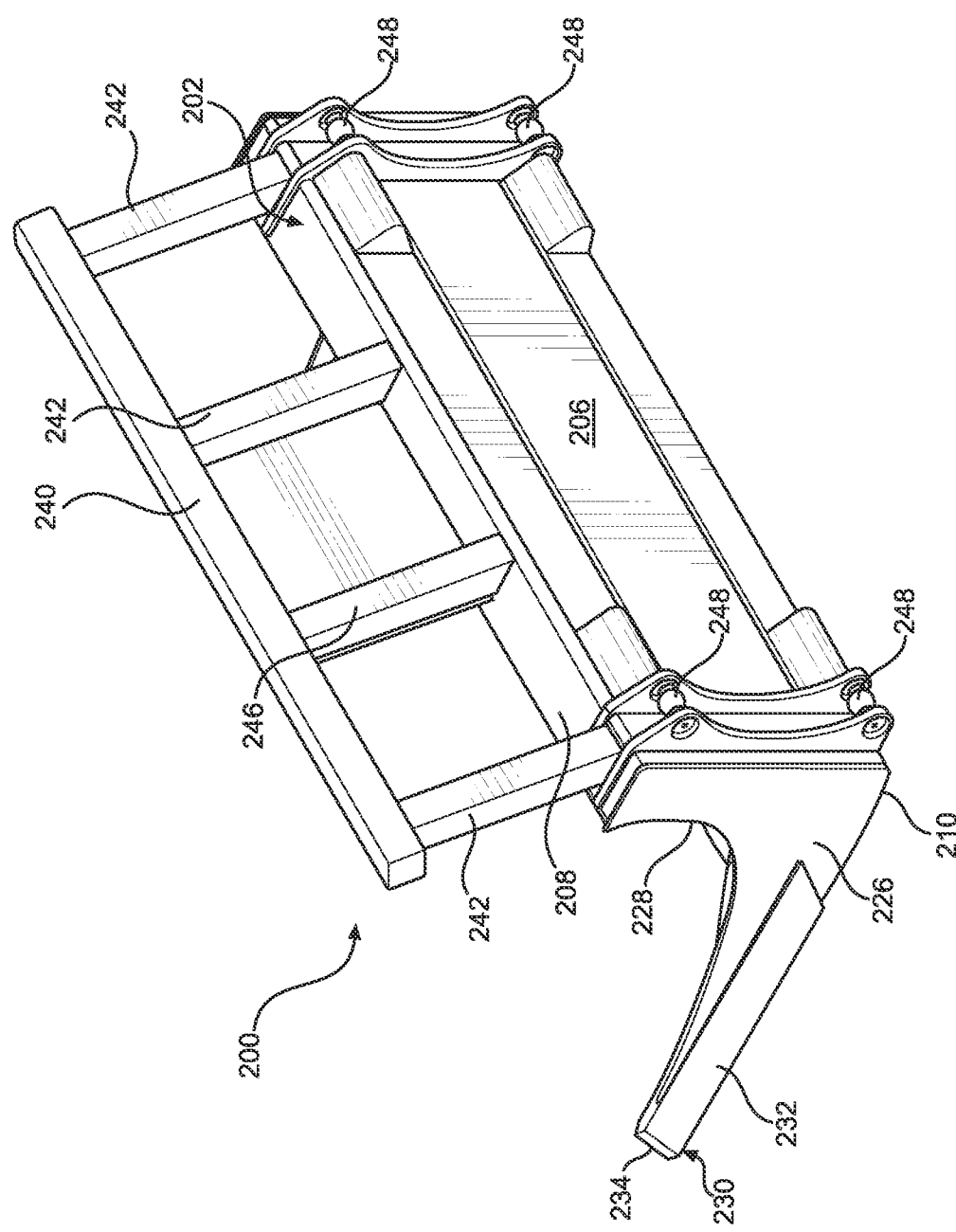


FIG. 5

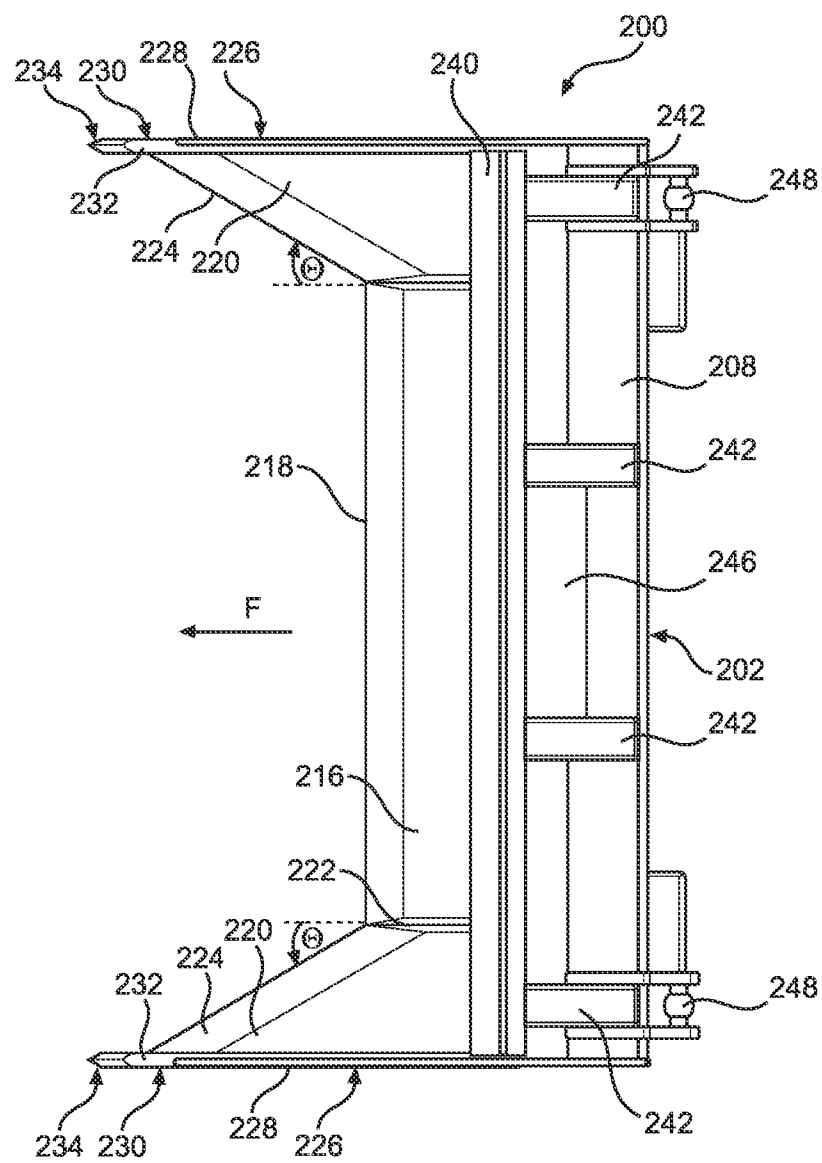
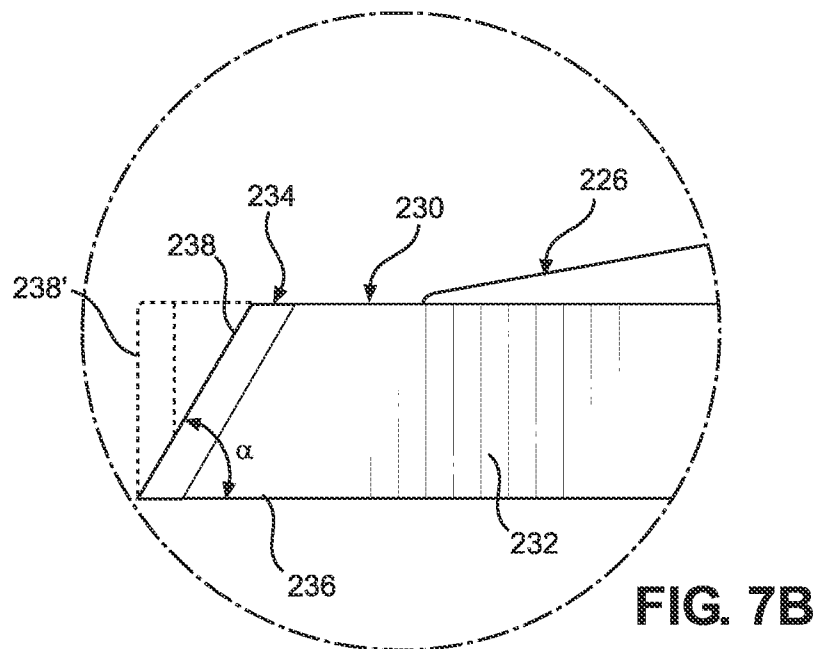
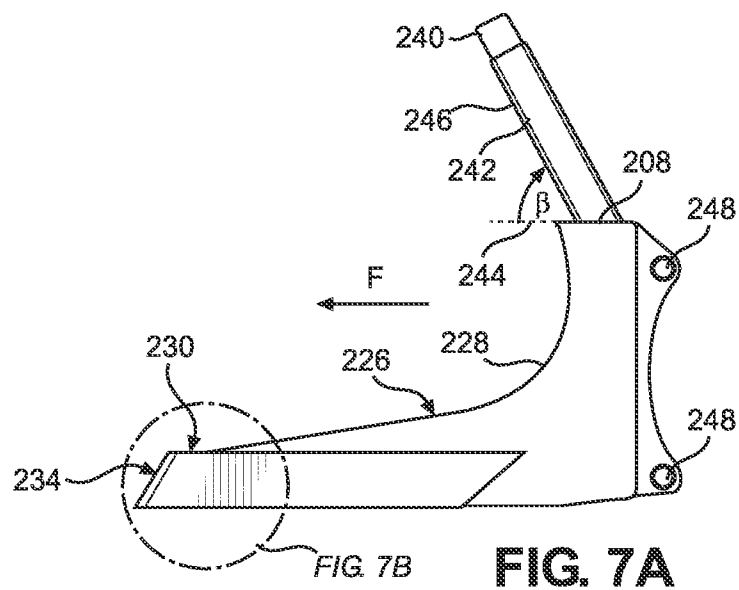


FIG. 6



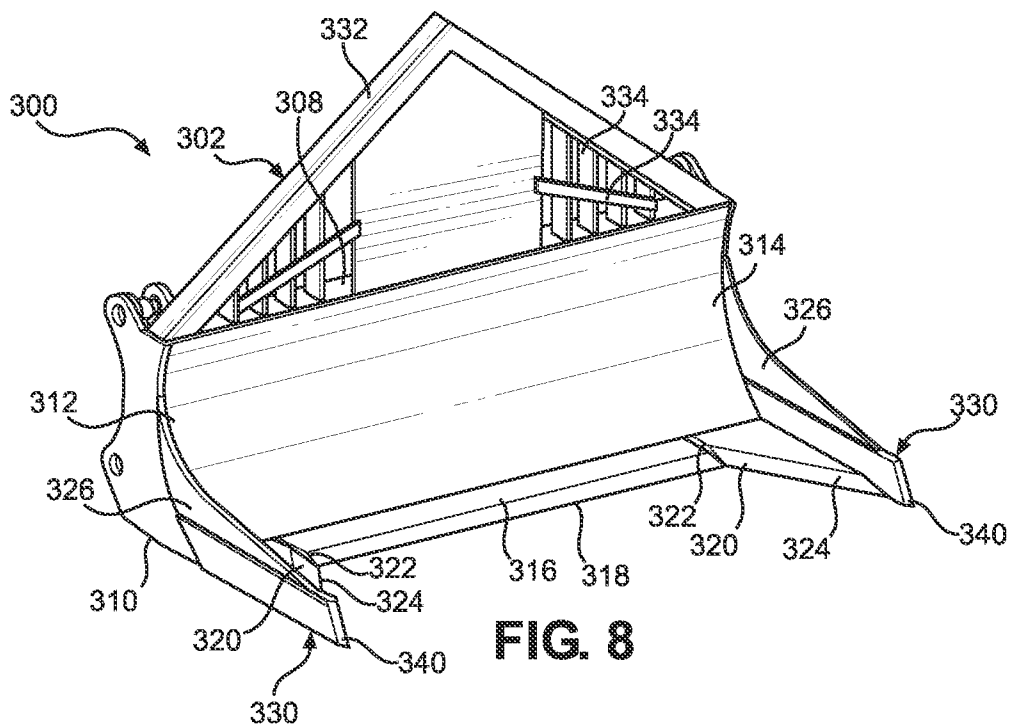


FIG. 8

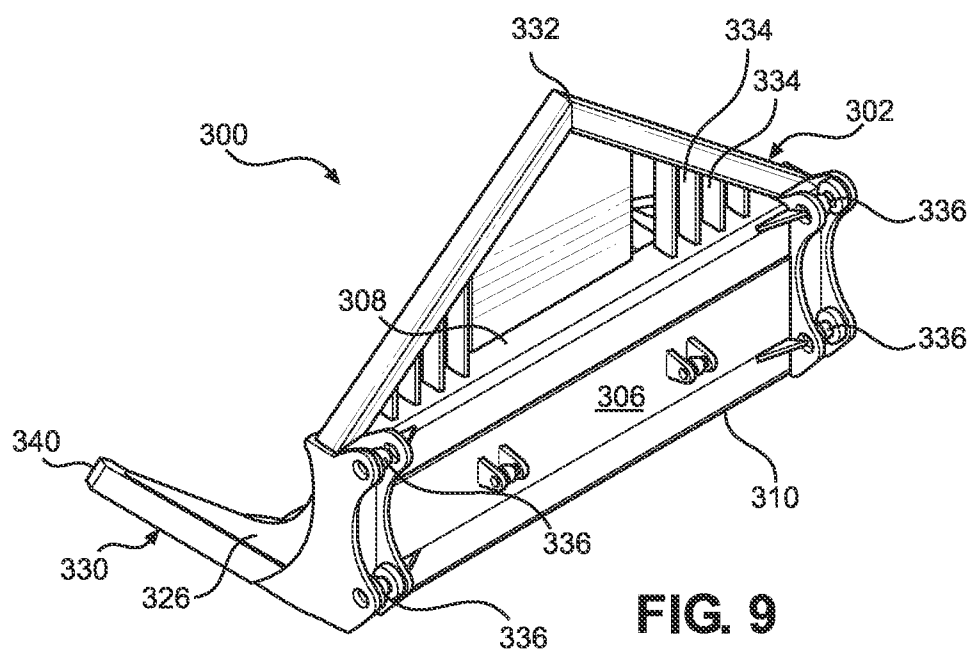


FIG. 9

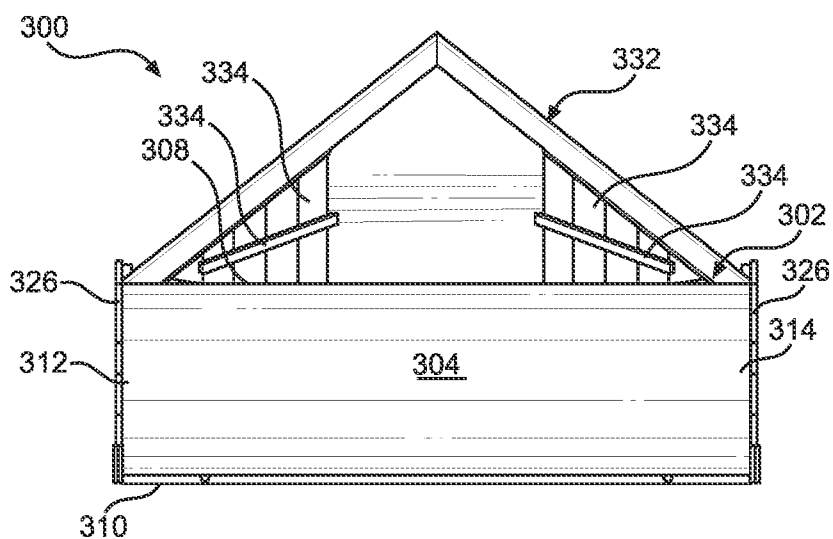


FIG. 10

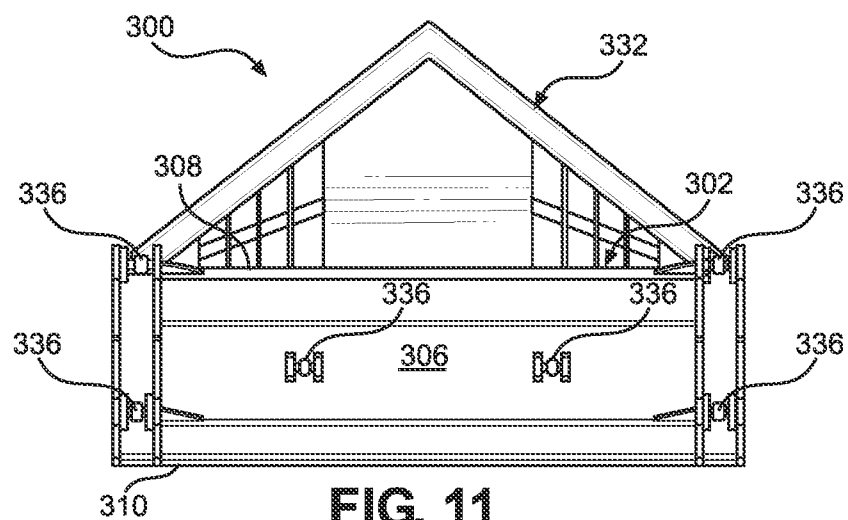


FIG. 11

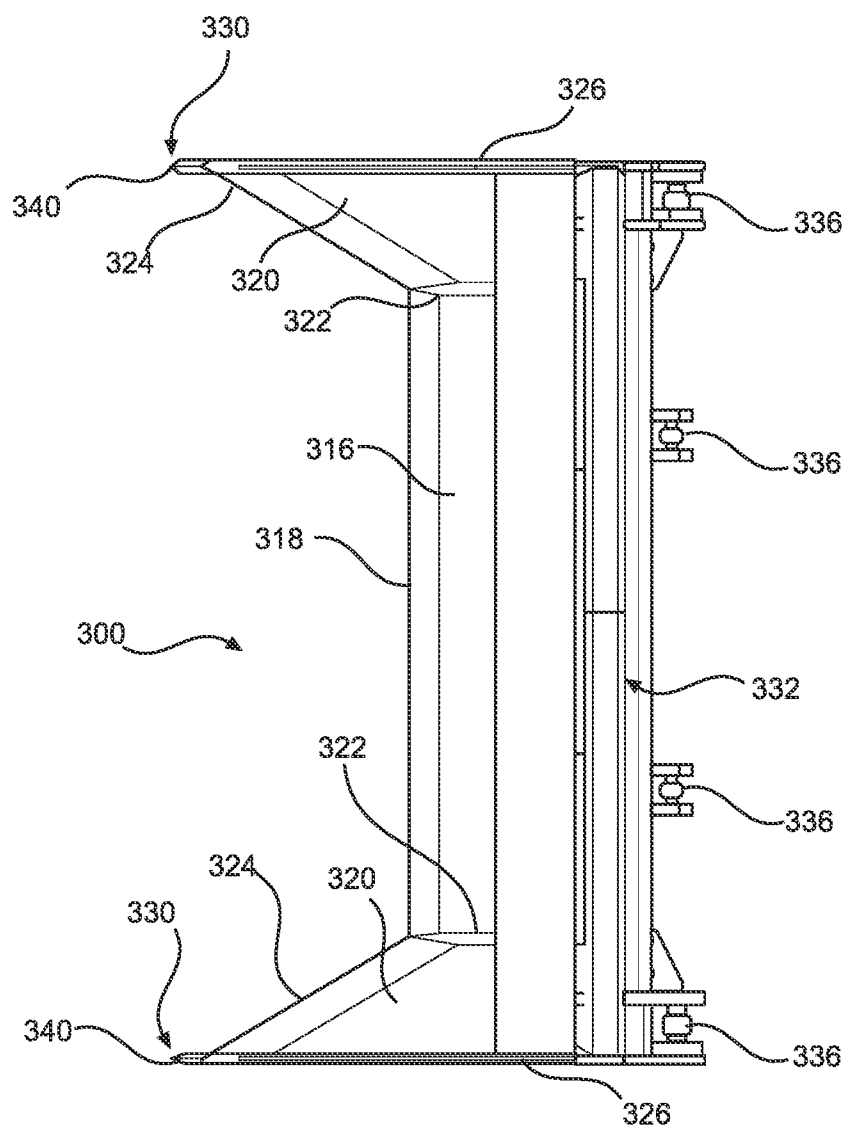


FIG. 12

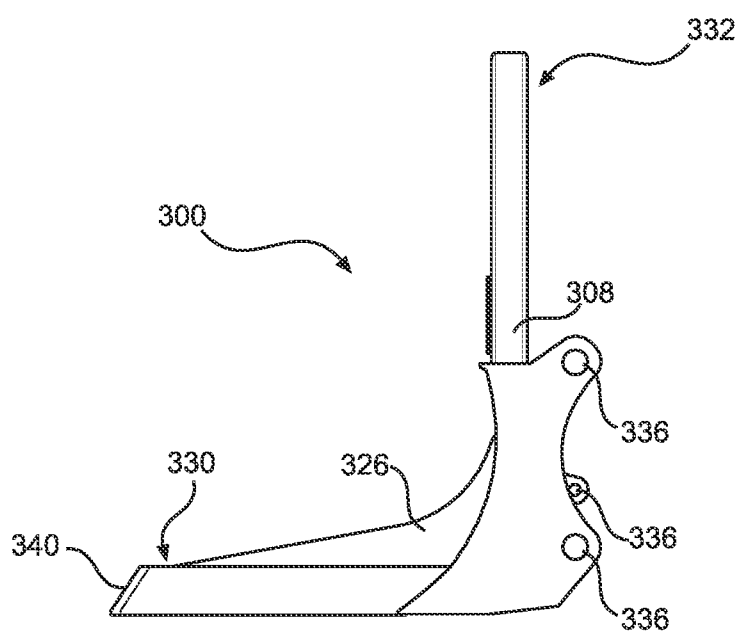


FIG. 13

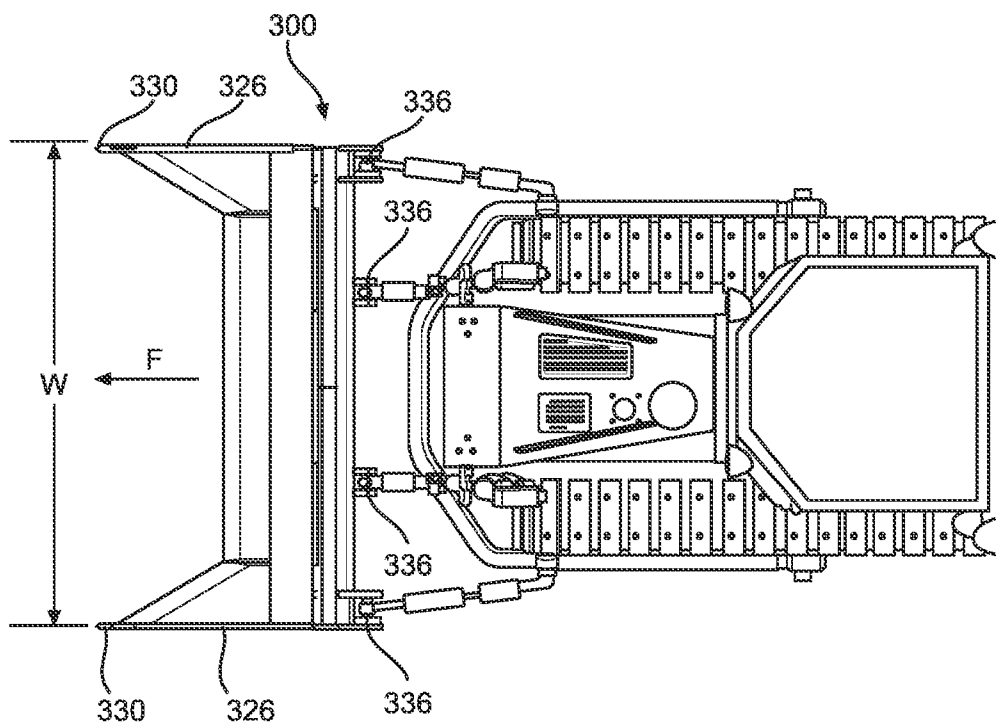


FIG. 14

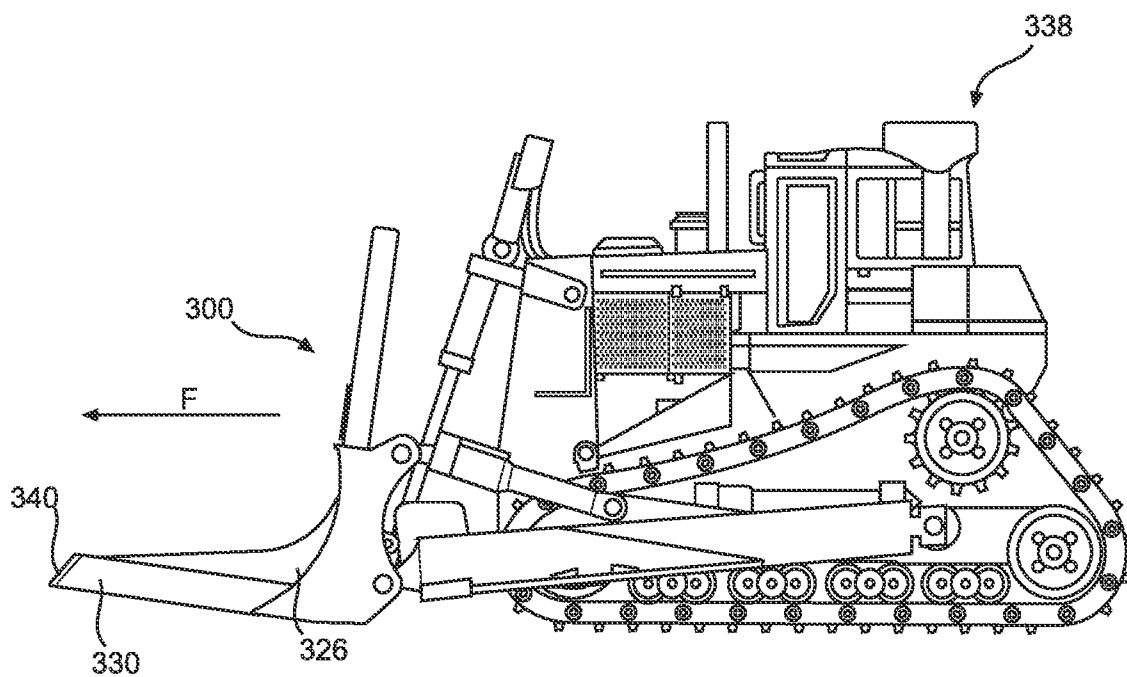


FIG. 15

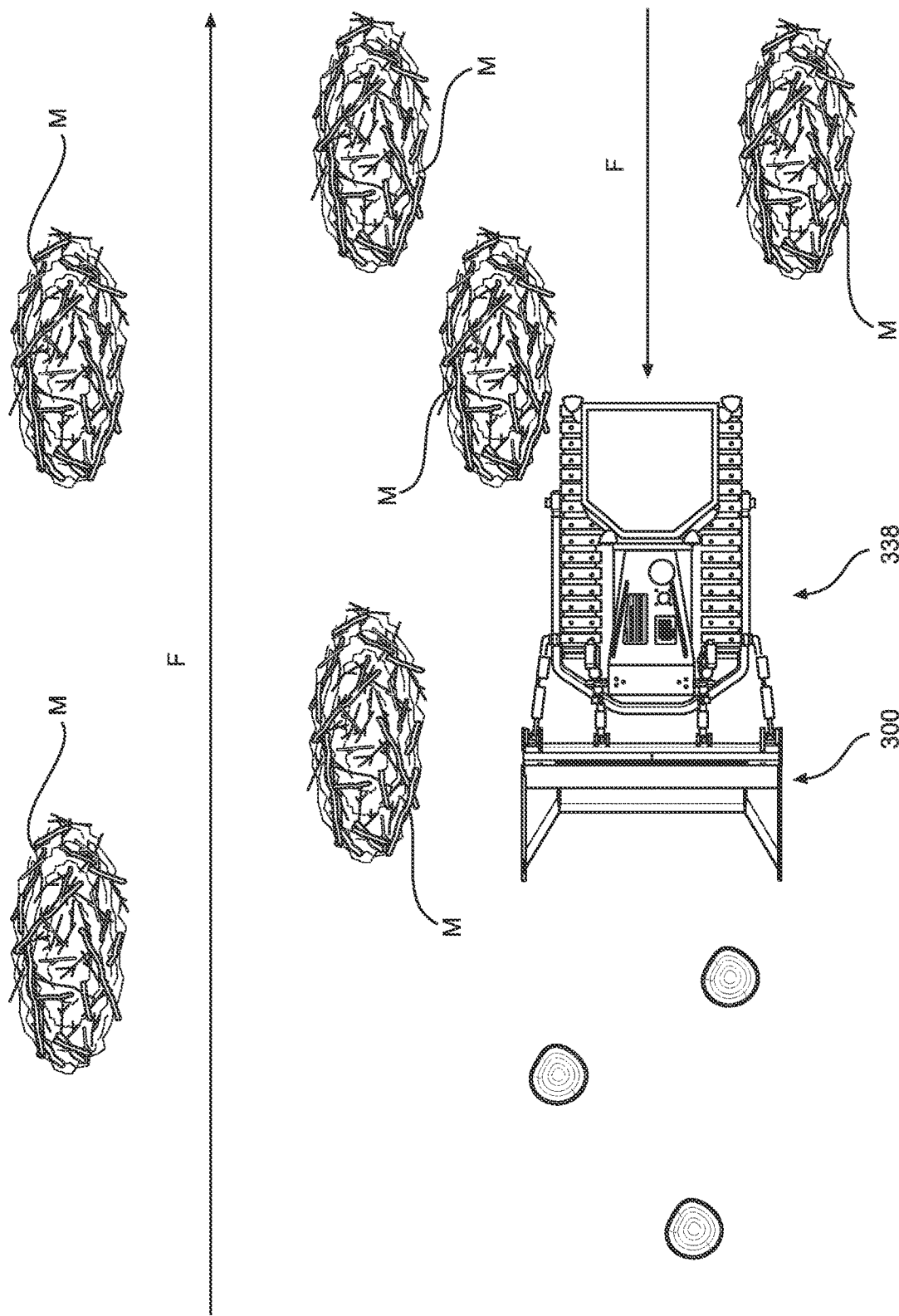


FIG. 16

LAND CLEARING BLADE FOR A MACHINE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 63/233,356 filed Aug. 16, 2021, and entitled “Land Clearing Blade For A Machine,” the content of which is incorporated herein by reference in its entirety.

FIELD

[0002] The present disclosure relates to land clearing blades. More particularly, the present disclosure relates to a land clearing blade adapted to be mounted to a machine for clearing trees, stumps, and other vegetative matter from an area of land.

BACKGROUND

[0003] Bulldozers, tractors, and other similar track-type tractors, dozers, and similar machines that are equipped with blades are used for a great many different purposes, including clearing a worksite of vegetative materials such as trees and stumps and pushing or repositioning loose material such as dirt and rocks about a worksite. These activities are indispensable to forestry, waste handling, building construction, and light to medium civil engineering. In many of these cases, a machine equipped with a heavy-duty blade, often called a “cutting blade”, is driven across, and through a worksite, such as a hill or wooded area, such that a cutting edge of the heavy-duty cutting blade penetrates downward and forward through the vegetative or other loose material at the worksite.

[0004] There are two primary types of land-clearing cutting blades that are in common use. The first is the “Hammond Blade” or “KG Blade”, which is described in U.S. Pat. No. 3,351,108. With reference to FIG. 1, there is shown an example of a machine 100, depicted as a tracked dozer in this case, equipped a blade 102 in the style of the Hammond Blade. As shown, this particular blade 102 provides center blade 104 that is angled forwards of a first side 106 of the blade to provide a leading prong 108 that is longer and extends outwards further than the opposing second side 110 of the blade. The blade 102 itself provides an inwardly curved leading edge 112 that extends between the first side 106 and the second side 110. Additionally, a single side-mounted stinger 124 sometimes extends forwards from the leading prong 108 on the first side 106 of the blade 102. Stinger 124 is intended to pierce and then split material, such as vegetative material (e.g., trees), located the worksite.

[0005] With continued reference to FIG. 1 and with further reference to FIG. 2, machine 100 is configured to travel generally forward in a travel direction F. When the machine 100 is in use, it travels generally forward in a first travel direction F1 and vegetation, soil, rock, etc. are cut and gathered by the blade 102 into piles of cut material M. As the machine 100 continues moving forward in first travel direction F1, the collected materials M are gathered in front of are then conveyed by the blade 102 from the first side 106 to the opposite second side 110. This cutting, gathering, conveying, and depositing process of material M is sometimes called windrowing. The collected materials M are deposited in piles located along the second side 110 of the machine 100 as the machine travels in first travel direction F1. It may be appreciated that, due to the construction of the blade 102, in

order to ensure that material M, such as trees, are cut and felled in the same direction, the machine can only make cutting passes (i.e., where material is cut with the blade 102) when traveling in the first direction F1 (i.e., right-to-left, as shown in FIG. 2). It must then make a non-cutting pass (i.e., where material is not cut) while traveling in a second travel direction F2 (i.e., from left-to-right in FIG. 2). In FIG. 2, cutting passes are depicted by solid arrows, whereas non-cutting passes are depicted by dashed arrows. Ensuring that materials fall in the same direction is particularly important when the machine 100 is working on a hill, where cut trees and other materials are typically felled downhill. Making the non-cutting pass in the second travel direction F2 to return the machine to the starting side of the hill is inefficient.

[0006] A second common type of land-clearing or cutting blade is a V-type or V-shear blade, which is described in U.S. Pat. No. 5,687,784. With reference to FIG. 3, a V-type blade 116 is shown, which blade is provided with a pair of concave blades 118 that are joined together at an angle and that meet at a vertex 120 located at the center of the blade. A blade edge 122 provided at the bottom end of each of the concave blades 118 is used to shear vegetative materials. Next, as with the Hammond blade 102 discussed previously, the V-type blade 116 may be provided with a single stinger 124 that extends forwardly from the vertex 120 and is intended to pierce and then split material, such as vegetative material (e.g., trees), located the worksite. As discussed in the '784 patent, a primary purpose of the V-type blade 116 is to simplify the process of controlling the direction that cut trees are felled. The trees are first cut by the blade edge 122 and are then guided away from machine by the blades 118. However, due to the diverging blade 118, use of the V-type blade 116 results in separate piles of cut material located on each side of the machine instead of a single collected pile of cut material. These separate piles of material can make the cleanup and disposal of that material more difficult.

[0007] In each of the above-described blades, transport of the blade and accompanying machine are difficult due to the large overall dimensions and weight of the blades. In many cases, it is not possible to transport a machine having the blade attached. For that reason, it is necessary to attach the blade to the machine at the worksite before work can begin and then detach the blade from the machine after the work has been completed and before the machine can be removed from the worksite.

[0008] These and other issues have resulted in a decline in the use of clearing blades, where cut material is sheared off, compared to other land clearing methods, where entire stumps and root balls are extracted and removed. For example, hydraulic excavators with thumbs have become a commonly-used tool used in clearing land. However, while there are certain advantages associated with the use of these latter methods, a major disadvantage is that they cause substantially more disturbance to the land and remove a much larger amount of the desired topsoil compared to clearing blades. Topsoil is an important but declining resource that is expensive to replace. The use of land clearing blades allows more of the top soil to be left in place for many applications.

[0009] A second disadvantage of more modern land clearing methods is that removing large amounts of topsoil with the vegetative materials makes the destruction or recycle of that vegetative material difficult. For example, in many remote areas, after an area has been cleared of trees, the

remaining cut material is gathered into piles and then destroyed using air curtain destructors, trench burning, and other incendiary methods. However, when the vegetative materials include large amounts of topsoil, the burning process is difficult and the resulting smoke is more laden with non-combustible particulate matter. The combustion of “cleaner” vegetative material (i.e., with less soil and other non-combustible material included) results in a cleaner and faster removal process.

[0010] Accordingly, what is needed is a land-clearing blade that permits cutting passes in any direction of travel; that bundles cut material into a single pile; that is small enough to be easily transported while mounted to the working machine (e.g., the dozer); that is configured to mount to modern working machines having push arms, power tilt cylinders, and trunnion mounts; and provides cleaner resulting cut vegetative material with less topsoil and non-combustible materials.

Notes on Construction

[0011] The use of the terms “a”, “an”, “the” and similar terms in the context of describing embodiments or implementations of the invention are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms “comprising”, “having”, “including” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to;”) unless otherwise noted. The terms “substantially”, “generally” and other words of degree are relative modifiers intended to indicate permissible variation from the characteristic so modified. The use of such terms in describing a physical or functional characteristic of the invention is not intended to limit such characteristic to the absolute value which the term modifies, but rather to provide an approximation of the value of such physical or functional characteristic.

[0012] Terms concerning attachments, coupling and the like, such as “attached”, “connected” and “interconnected”, refer to a relationship wherein structures are secured or attached to one another either directly or indirectly through intervening structures, as well as both moveable and rigid attachments or relationships, unless otherwise specified herein or clearly indicated as having a different relationship by context. The term “operatively connected” is such an attachment, coupling or connection that allows the pertinent structures to operate as intended by virtue of that relationship.

[0013] The use of any and all examples or exemplary language (e.g., “such as” and “preferably”) herein is intended merely to better illuminate the invention and the preferred embodiments or implementations thereof, and not to place a limitation on the scope of the invention. Nothing in the specification should be construed as indicating any element as essential to the practice of the invention unless so stated with specificity.

SUMMARY OF THE INVENTION

[0014] The above and other problems are addressed by a clearing blade adapted to be attached to a machine. The clearing blade includes a moldboard having a curved structure, a pair of stingers extending forwardly of the moldboard and arranged in a spaced apart arrangement from opposing lateral ends of the clearing blade. Each stinger includes a

penetration portion adapted to penetrate and form a vertical cut inside of vegetation. The clearing blade further includes a center blade arranged centrally to the moldboard, and an angled blade extending inwardly from each of the pair of stingers towards the center blade. Each angled blade is arranged in a substantially horizontal plane and is arranged at an obtuse angle relative to the center blade. Moreover, the clearing blade includes a plurality of attachment members such as, for example, a plurality of trunnion balls for engaging the clearing blade with the machine.

BRIEF DESCRIPTION OF DRAWINGS

[0015] Further advantages of the invention are apparent by reference to the detailed description when considered in conjunction with the figures, which are not to scale so as to more clearly show the details, wherein like reference numerals represent like elements throughout the several views, and wherein:

[0016] FIG. 1 is an overhead view depicting a conventional Hammond-type land clearing blade mounted to a tracked dozer;

[0017] FIG. 2 is an overhead view depicting the Hammond-type land clearing blade and dozer of FIG. 1 in use to clear an area of land to provide windrow cut material piles;

[0018] FIG. 3 is a front perspective view depicting a conventional V-type land clearing blade;

[0019] FIGS. 4 and 5 are front and rear perspective view of a land-clearing blade according to an embodiment of the present invention;

[0020] FIG. 6 is an overhead view depicting the land-clearing blade of FIG. 4;

[0021] FIG. 7A is a right-side elevation view depicting the land-clearing blade of FIG. 4;

[0022] FIG. 7B is a detail view of a circled portion of a stinger shown in FIG. 7A and identified as “FIG. 7B”; and

[0023] FIGS. 8 and 9 are front and rear perspective views, respectively, of a land-clearing blade according to an alternative embodiment of the present invention;

[0024] FIGS. 10 and 11 are front and rear elevation views, respectively, of the land-clearing blade of FIG. 8;

[0025] FIG. 12 is an overhead view of the land-clearing blade of FIG. 8;

[0026] FIG. 13 is a right-side elevation view depicting the land-clearing blade of FIG. 8;

[0027] FIG. 14 is an overhead view of the land-clearing blade of FIG. 8 mounted to a tracked dozer;

[0028] FIG. 15 is a side elevation view depicting the land-clearing blade and tracked dozer of FIG. 13;

[0029] FIG. 16 is an overhead view depicting the land-clearing blade and tracked dozer of FIG. 14 in use to clear an area of land to provide bundled cut material piles.

DETAILED DESCRIPTION

[0030] Referring now to the drawings in which like reference characters designate like or corresponding characters throughout the several views, there is shown in FIGS. 4-7B a land-clearing blade assembly 200 according to an embodiment of the present invention.

[0031] The blade assembly 200 includes a box-frame body 202 having a rolled moldboard providing a front surface 204. The body 202 further includes a rear surface 206 that is opposite the front surface 204, an upper end 208, an opposing lower end 210, a first lateral end 212 and an

opposing second lateral end **214**. A center blade **216** is preferably positioned at the lower end **210** of the body **202** and extends forwardly away from the front surface **204**. A straight cutting edge **218** is provided at the leading edge of the center blade **216** and extends laterally across a portion of the body **202** and is parallel with the front surface **204** of the body **202**. Preferably, center blade **216** is oriented horizontally (when blade assembly is viewed from a front elevation view).

[0032] Additionally, separate angled side blades **220** are also preferably joined to opposing lateral edges **222** of the center blade **216** such that an angled blade is located on each lateral side of center blade. Like the center blade **216**, each of the angled side blades **220** is preferably positioned at the lower end **210** of the body **202** and extends forwardly away from the front surface **204** of the body **202**. A straight cutting edge **224** is also provided at the leading edge of each of the angled side blades **220**. Cutting edges **224** of the angled side blades **220** also extend laterally across a portion of the body **202**. Preferably, cutting edge **224** is also oriented horizontally (when blade assembly is viewed from a front elevation view). However, unlike cutting edge **218**, cutting edges **224** are not parallel with the front surface **204** of the body **202**. Instead, cutting edges **224** are preferably oriented at an angle with respect to the front surface **204** of the body **202**, such that an angle Θ of approximately 20-40° is formed between travel direction F and the front of cutting edge **224**. Put differently, a complementary angle equal to 90 degrees minus Θ is formed between the front surface **204** of the body **202** and the front of cutting edge **224**. In the illustrated embodiment, angle Θ is approximately 30° for each of the angled side blades **220**.

[0033] In use, the center blade **216** is configured to cut smaller materials. For example, in certain embodiments, blade assembly **200** may be configured to cut materials having diameters in the range of 2-4 inches. Of course, the size of materials that may be cut will depend on the machine and configuration selected, such that materials with larger or smaller diameters may be processed. On the other hand, the angle Θ of angled side blades **220** has been shown in practice to be effective for cutting cut material, including larger diameter. For example, in certain embodiments, blade assembly **200** may be configured to cut materials having diameters in the range of 3+ inches. Again, the size of materials that may be cut will depend on the machine and configuration selected, such that materials with larger or smaller diameters may be processed. In use, as the blade assembly **200** is moved forward in direction F, the center blade **216** and angled side blades **220** may be positioned just low and just above the ground surface and level with respect to the ground surface in order to cut smaller vegetation at ground level. Advantageously, the presence and usage of the pair of angled side blades **220**, including one such angled blade located at each lateral end of the body **202**, cut material is cut and then directed via a funneling action by the angled blades towards the center blade **216**, where it is bundled together to form a single row of cut material. Additionally, any cut material that is not fully cut by the cutting edge **224** of the angled side blades **220** is preferably subsequently brought into contact with the cutting edge **218** of the center blade **216** to be fully cut.

[0034] In certain embodiments, the blade assembly **200** further includes side-mounted plates **226** mounted adjacent each of the lateral ends **212**, **214** of the body **202**. Plates **226**

preferably extend from upper end **208** to opposing lower end **210** and also extend forwardly from front surface **204** of body **202**. As such, plates **226** partially enclose a space directly in front of the front surface **204** of the body **202**, which facilitates the gathering or bundling of cut material discussed above and assists in keeping cut material located in front of the front surface and assists in preventing cut material from traveling around the lateral ends **212**, **214** of the body. In certain embodiments, a forward edge **228** of the side-mounted plates **226** is sharpened in order to provide yet another cutting edge for cutting cut material. Preferably, forward edge **228** is oriented vertically (when blade assembly is viewed from a front elevation view) and, therefore, orthogonal to center blade **216**. Further, as in FIG. 4, the forward edge **228** preferably curves downward in a longitudinal direction away from the front surface **204** of the moldboard and towards the sharpened piercing tip **234** of the stinger **230**.

[0035] In certain embodiments, the blade assembly **200** further includes penetrating stingers **230** are attached to the body **202** at each of the first and second lateral ends **212**, **214**. Preferably, the stingers **230** are formed as an additional forward extension of the side-mounted plates **226**. Each of the stingers **230** extends forwardly in a longitudinal direction away from the front surface **204** of the body **202**. Preferably, the stingers **230** extend outwards from the bottom of the blade assembly **200**. Each stinger **230** includes an arm portion **232** that is mounted to the plates **226**. Each of the stingers **230** terminates with a sharpened piercing tip **234** that may be used to penetrate cut material, such as tree trunks, and for progressive cutting of very large trees and stumps. In certain embodiments, including the illustrated embodiment, the piercing tip **234** is angled rearwards. For example, in the illustrated embodiment, an angle α is formed between the bottom surface **236** of the stinger **230** and a leading end **238** of the piercing tip **234**. In the illustrated embodiment, angle α is approximately 60°. However, angle α may be varied in order to make the stinger **230** produce more of a chopping or slicing result, when angle α is greater, or more of a piercing result, when angle α is more shallow. In preferred embodiments, angle α may range from approximately 20° to approximately 90°. Dashed lines in FIG. 7B illustrate an alternative piercing tip where angle α is equal to 90°.

[0036] The cutting edge **218** of center blade **216**, the cutting edges **224** of each of the angled side blades **220**, and the piercing tip **234** of each of the stingers **230** are designed with a sharpened knife edge to form the cutting or piercing edge and represent the major working surfaces of the blade assembly **200**. As such, the edges **218**, **224** and piercing tip **234** are formed from a hardened steel and are configured to be easily and repeatedly sharpened. For example, the cutting edges **218**, **224** may be formed using a single bevel, double (i.e., a “V”) bevel, or compound bevel edge. In certain embodiments, the cutting edge **218** of the center blade **216** is connected continuously with the cutting edges **224** of each of the angled side blades **220** in order to form a continuous cutting edge along the front of the entire lateral length of the center and angled blades.

[0037] In preferred embodiments, the blade assembly **200** includes a pusher bar **240** positioned above the upper end **208** of the body **202**. The pusher bar **240** may be connected to the upper end **208** of the body **202** via a plurality of angled supports **242**. The pusher bar **240** may be used to assist in

pushing over cut material, such as trees and shrubs, which are not broken up by the stingers 230 or center blade 216. The angled supports 242 are configured such that the pusher bar 240 is positioned above and in front of the forward edge 228 of the side-mounted plates 226. In certain embodiments, the angled supports 242 are oriented at an angle β that is between 30° and 70°, taken with respect to an axis 244 that is parallel with travel direction F. In the illustrated example, angle β is approximately 60°. In certain embodiments, one or more pusher plates 246 extend partially and entirely between the upper end 208 of the body 202 and the pusher bar 240. In the illustrated embodiment, a single pusher plate 246 is centrally-mounted to the blade assembly 200 between a middle pair of angled supports 242. The pusher plate 246 provides rigidity to the pusher bar 240 and further assists in pushing over cut material.

[0038] Preferably, blade assembly 200 is smaller and lighter than conventional land clearing blades. As shown best in FIGS. 5 and 6, mounts 248 extending rearwards from the rear surface 206 of the body 202 preferably enable the blade assembly 200 to be mounted to a machine, such as a dozer or track-type tractor machine without the need for heavy specialize mounts or reinforcing means. Additionally, the smaller overall size of blade assembly 200 preferably enables the blade assembly to be mounted to the machine during transportation to and from the worksite. It should be understood that the precise type and mounting location of mounts 248 may change depending on the type of machine. However, preferably, blade assembly 200 is small enough that a C-frame mount and the like, which is exceedingly heavy, is not necessary. For example, in certain embodiments, including the illustrated embodiment, mounts 248 may include trunnion balls and receivers that are fixedly attached to the body 202.

[0039] With reference to FIGS. 8-13, there is shown a blade assembly 300 according to an alternative embodiment of the present invention. Blade assembly 300 is, in large part, structurally and functionally similar to blade assembly 200. In particular, blade assembly 300 includes a box-frame body 302 having a rolled moldboard providing a front surface 304. The body 302 further includes a rear surface 306 that is opposite the front surface 304, an upper end 308, an opposing lower end 310, a first lateral end 312 and an opposing second lateral end 314. A center blade 316 is preferably positioned at the lower end 310 of the body 302 and extends forwardly away from the front surface 304. A straight cutting edge 318 is provided at the leading edge of the center blade 316 and extends laterally across a portion of the body 302 and is parallel with the front surface 304 of the body 302. Separate angled blades 320 are also preferably joined to opposing lateral edges 322 of the center blade 216 at the lower end 310 of the body 302 and extend forwardly away from the front surface 304 of the body 302. A straight cutting edge 324 is also provided at the leading edge of each the angled blades 320. Side-mounted plates 326 are mounted adjacent each of the lateral ends 312, 314 of the body 302. Lastly, penetrating stingers 330 are attached to the body 302 at each of the first and second lateral ends 312, 314. However, unlike blade assembly 200, blade assembly 300 is provided with a vertically-oriented a pusher bar 332 that is positioned above the upper end 308 of a body 302. The pusher bar 332 may be connected to the upper end 308 of the body 302 via a plurality of vertical and/or cross supports 334. The pusher bar 332 may be used to assist in pushing

over cut material, such as trees and shrubs. However, a primary function of pusher bar 332 will be to deflect debris and cut material forwards and away from the blade assembly 300 and the machine to which it is mounted.

[0040] With reference now FIGS. 14 and 15, blade assembly 300 is also provided with a plurality of mounts 336 that are configured to mount blade assembly a wide range of earth-moving machines, modern dozers, etc., including tracked dozer 338, which have push arms and power tilt cylinders, such that the blade assembly of the present invention to be used interchangeably with other blades, rakes, and other earth-working implements. This type of mounting would enable, for example, the blade assembly 300 to be tilted or “favor” during operation such that a single stinger 330 is located near the ground surface while the other stinger is raised away from the ground surface. In certain embodiments, blade assembly 300 has a width, measured from side-mounted plates 326 to side-mounted plate, which is narrower than the width W of the machine 338 to which it is mounted in order to provide the ease of transport and ease of mounting benefits discussed above.

[0041] Blade assembly 300 is configured to cut and remove cut material, including on a hillside, when traveling in any direction. Additionally, when blade assembly 300 is in use, either stinger 330 may be used in the removal of cut material. The stingers 330 are a primary wear component for the blade assembly 300 that require periodic replacement and sharpening. Providing a pair of stingers 330 reduces the wear on each stinger 330 and extends their useful life and the maintenance interval, which improves “up” time for the blade assembly 300. In use, the stingers 330 are configured to be driven into a tree or stump. As the stinger 330 passes into the cut material, a piercing tip 340 makes a first vertical cut in the material which preferably holds the blade assembly 200 in place at a specific horizontal position within the material (i.e., the blade assembly is prevented from moving laterally). As the blade assembly 300 continues forward in travel direction F, the stinger 330 continues to cut/tear the cut material. Eventually, one or more of the angled blades 320 is forced into the cut material and makes a second and subsequent cut that is oriented horizontally (i.e., perpendicular to the first cut) in the cut material. Eventually, as the blade assembly 300 continues traveling forward in the travel direction F, the first and second cuts exsect a portion of the cut material (i.e., the tree or stump). The blade assembly 300 may be reversed and then the above-described process repeated in order to remove additional portions of the cut material. For example, in the case of a large tree stump, the process might be repeated multiple times in order to progress laterally across or vertically downward through the cut material.

[0042] With reference again to FIG. 12 and with further reference to FIG. 16, another advantage of blade assemblies 200, 300 of the present invention over the conventional land clearing blades discussed above is that cutting passes can be made in any travel direction. As the machine to which the blade assemblies 200, 300 are mounted (e.g., dozer 338) moves forward in travel direction F, materials are cut either by the center blade 316, angled blades 320 and side-mounted plates 326. As discussed above, this might require the machine to back up and then drive forward again in order to make repeated cuts or strikes while traveling in general travel direction F. However, these blade assemblies 200, 300 avoid the need of wasteful and inefficient non-cutting passes

(F2, shown in FIG. 2) discussed earlier. Once the materials are cut, they are then gathered together to form piles of cut material M that are later picked up and moved elsewhere.

[0043] Although this description contains many specifics, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred implementations thereof, as well as the best mode contemplated by the inventor of carrying out the invention. The invention, as described herein, is susceptible to various modifications and adaptations as would be appreciated by those having ordinary skill in the art to which the invention relates.

What is claimed is:

1. A blade assembly configured to be mounted to a machine for use in cutting, moving and clearing cut matter from an area of land when the machine moves in a travel direction F, the blade assembly comprising:

a body having:

- a moldboard providing a front surface;
- a rear surface that is opposite the front surface;
- an upper end;
- an opposing lower end;
- a first lateral end; and
- an opposing second lateral end

a center blade positioned at the lower end of the body and extending forwardly away from the front surface;

a cutting edge provided at a leading edge of the center blade, wherein the cutting edge extends laterally across and parallel with at least a portion of the front surface of the body; and

mounts for enabling the blade assembly to be mounted to the machine.

2. The blade assembly of claim 1 further comprising at least one penetrating stinger attached to one of the lateral ends of the body, wherein the at least one penetrating stinger extends forwardly in a longitudinal direction away from the front surface of the body and terminates with a sharpened piercing tip configured to penetrate cut material.

3. The blade assembly of claim 2 further comprising a side mounted plate disposed on the one lateral end of the body, wherein the at least one penetrating stinger is formed as an extension of the side mounted plate.

4. The blade assembly of claim 3 further comprising a sharpened forward edge formed at a front end of the side mounted plate.

5. The blade assembly of claim 4 wherein the sharpened forward edge curves downwards in the longitudinal direction away from the front surface of the moldboard and towards the sharpened piercing tip of the at least one penetrating stinger.

6. The blade assembly of claim 3 further comprising:

an angled side blade joined to a lateral edge of the center blade such that the angled side blade is located on a lateral side of the center blade, wherein the angled side blade is positioned at the lower end of the body and extends forwardly away from the front surface of the moldboard;

a cutting edge provided at a leading edge of the angled side blade that is angled with respect to the cutting edge of the center blade.

7. The blade assembly of claim 6 wherein the cutting edge of the angled side blade abuts the cutting edge of the center blade to form a combined cutting edge.

8. The blade assembly of claim 2:

wherein the sharpened piercing tip is provided on a leading end of the at least one penetrating stinger; wherein the at least one stinger includes a bottom surface; and

wherein the leading end is angled with respect to the bottom surface of the at least one stinger such that the piercing tip is angled rearwards.

9. The blade assembly of claim 1 further comprising a penetrating stinger attached to each of the lateral ends of the body, wherein each penetrating stinger extends forwardly in a longitudinal direction away from the front surface of the body and terminates with a sharpened piercing tip configured to penetrate cut material.

10. The blade assembly of claim 9 further comprising a side mounted plate disposed at each of the lateral ends of the body, wherein each penetrating stinger is formed as an extension of one of the side mounted plates.

11. The blade assembly of claim 10 further comprising a sharpened forward edge formed at a front end of each of the side mounted plates.

12. The blade assembly of claim 11 wherein the sharpened forward edge of each of the side mounted plates curves downwards in the longitudinal direction away from the front surface of the moldboard and towards the sharpened piercing tip of the penetrating stinger.

13. The blade assembly of claim 10 further comprising:

a separate angled side blade joined to each opposing lateral edge of the center blade such that the angled side blades are located on opposing lateral ends of the center blade, wherein the angled side blades are each positioned at the lower end of the body and extend forwardly away from the front surface of the moldboard; a cutting edge provided at a leading edge of each of the angled side blades, wherein each cutting edge is angled with respect to the cutting edge of the center blade.

14. The blade assembly of claim 13 wherein the cutting edge of each of the angled side blades abuts the cutting edge of the center blade to form a combined cutting edge.

15. The blade assembly of claim 1 further comprising a pusher bar connected to the upper end of the body via a plurality of supports mounted between the body and the pusher bar, wherein the pusher bar is configured to contact cut material located above the upper end of the body.

16. The blade assembly of claim 15 wherein the plurality of supports position the pusher bar vertically above the body and at least partially in front of the front surface of the moldboard.

17. The blade assembly of claim 15 further comprising a pusher plate located above the body and connecting the pusher bar to the body.

18. A land-clearing machine and blade combination comprising:

a land-clearing machine having a pair of independently operable mounting members, each mounting member configured to removably mount to a portion of a blade assembly disposed at an end of the land-clearing machine and to manipulate a position and orientation of the blade assembly;

a blade assembly configured to be removably mounted to the land-clearing machine and configured for use in cutting, moving and clearing cut matter from an area of land when the land-clearing machine moves in a travel direction F, the blade assembly comprising:

a body having:

- a moldboard providing a front surface;
 - a rear surface that is opposite the front surface;
 - an upper end;
 - an opposing lower end;
 - a first lateral end; and
 - an opposing second lateral end
- a center blade positioned at the lower end of the body and extending forwardly away from the front surface;
- a cutting edge provided at a leading edge of the center blade, wherein the cutting edge extends laterally across and parallel with at least a portion of the front surface of the body;
- a pair of mounts disposed on the body, wherein each mount is removably mounted to one of the pair of independently operable mounting members of the land-clearing machine

a penetrating stinger attached to each of the lateral ends of the body, wherein each penetrating stinger extends forwardly in a longitudinal direction away from the front surface of the body and terminates with a sharpened piercing tip configured to penetrate cut material.

19. The combination of claim **18** wherein the independently operable mounting members of the land-clearing machine are push arms or power tilt cylinders.

20. The combination of claim **18** wherein the independently operable mounting members of the land-clearing machine are configured to allow the land-clearing machine to travel and the blade assembly to cut, move and clear cut material while the blade assembly is tilted such that one of the stingers is located at a first elevation while the other stinger is located at a second and different elevation.

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