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(54) **V-BLADE SNOW PLOW WITH IMPROVED CUTTING EDGE**

Publication Classification

(75) **Inventors:** **Chad Barker**, Franksville, WI (US); **James Pieper**, Glen Cove, ME (US); **Mark Stultz**, Whitefield, ME (US)

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(52) **U.S. Cl.** **37/196; 37/266**
(57) **ABSTRACT**

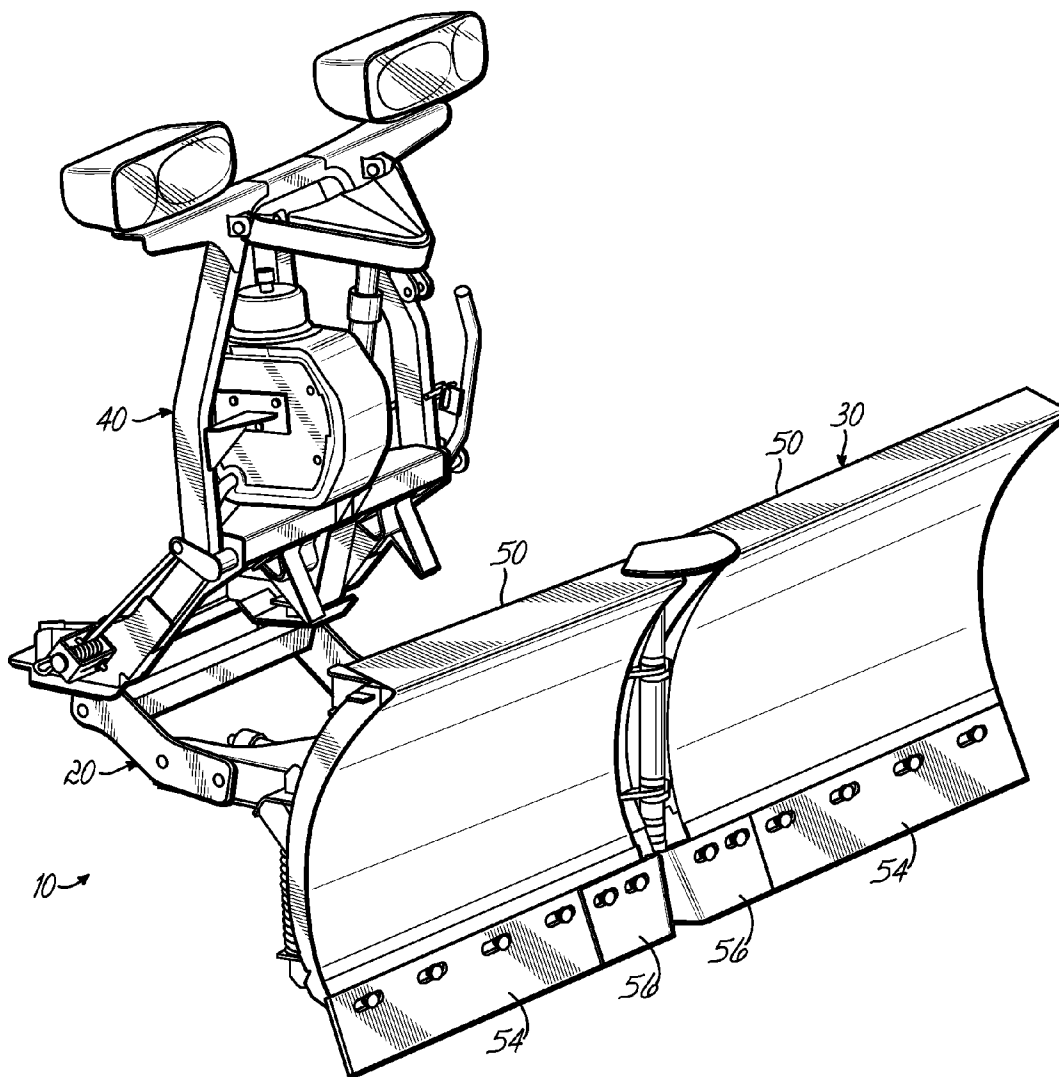
Correspondence Address:
WOOD, HERRON & EVANS, LLP
2700 CAREW TOWER, 441 VINE STREET
CINCINNATI, OH 45202 (US)

A snow plow assembly comprises an A-frame assembly, a V-blade assembly pivoted to one end of the A-frame assembly, and a lift frame assembly pivoted to the other end of the A-frame assembly, the lift frame assembly adapted to be removably attached to a vehicle. The V-blade assembly comprises a pair of blades hinged together along inboard ends thereof, each blade of the pair of blades including first and second cutting edge plates removably secured to the blade, the first cutting edge plate fabricated of a first material, the second cutting edge plate fabricated of a second material, the first material having a greater resistance to abrasion wear than the second material.

(73) **Assignee:** **Douglas Dynamics, L.L.C.**, Milwaukee, WI (US)

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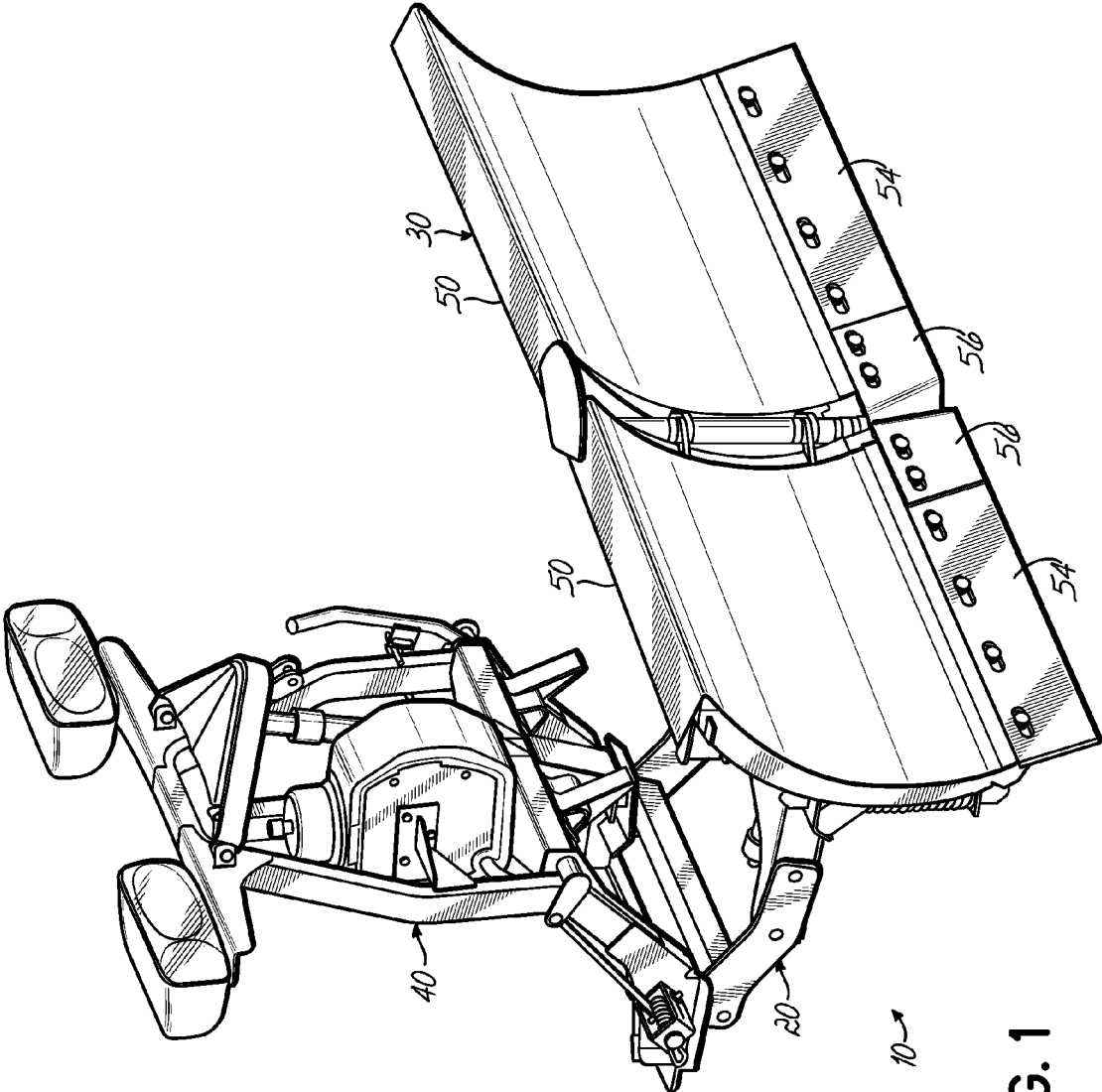


FIG. 1

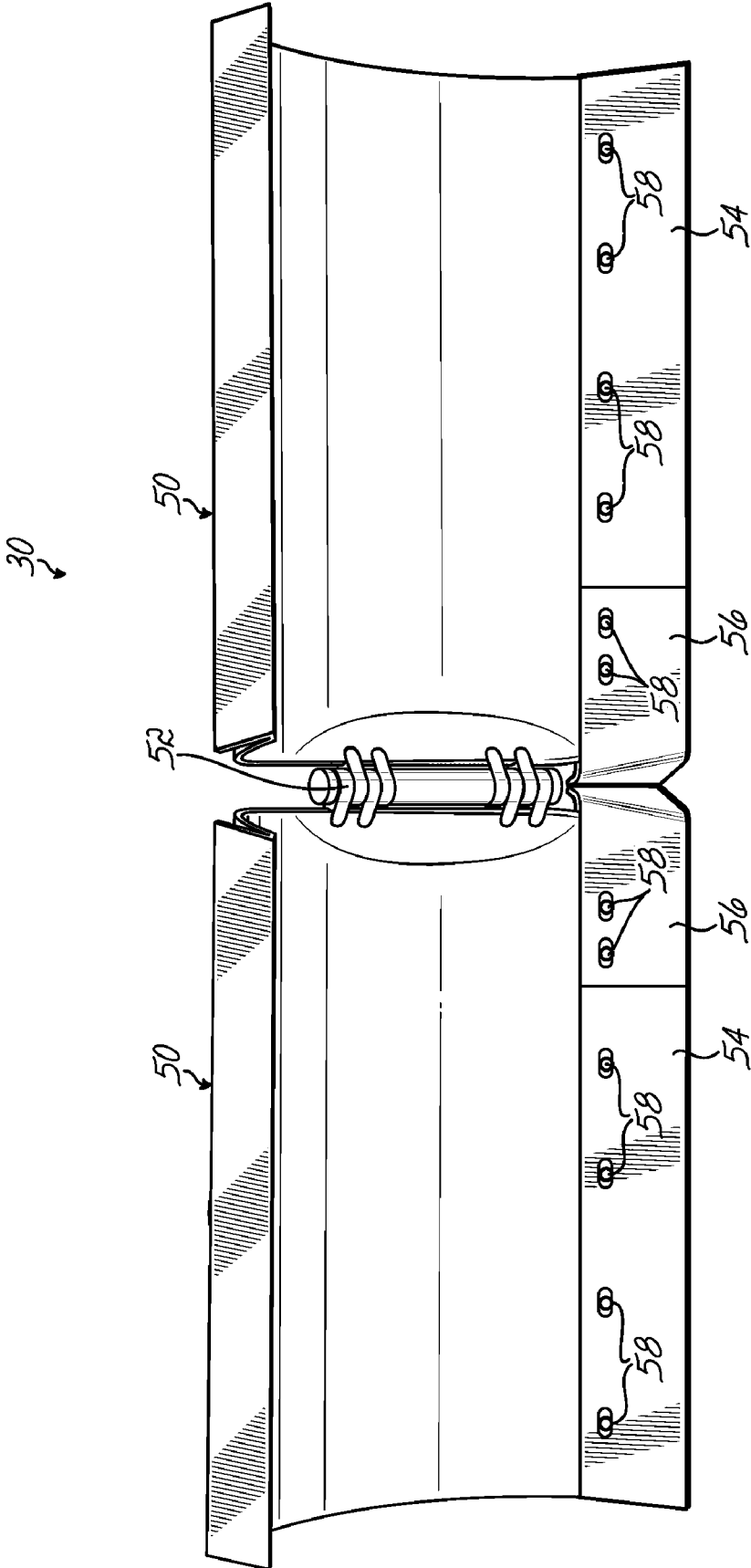


FIG. 2

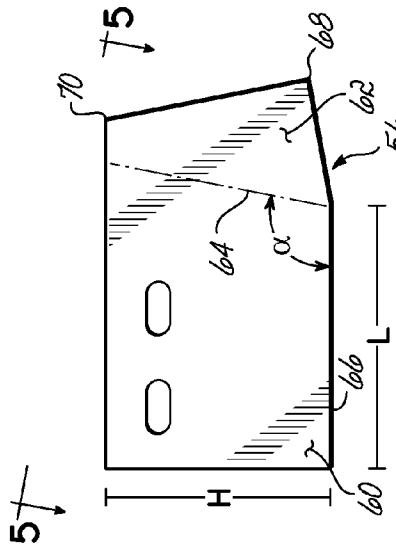


FIG. 4

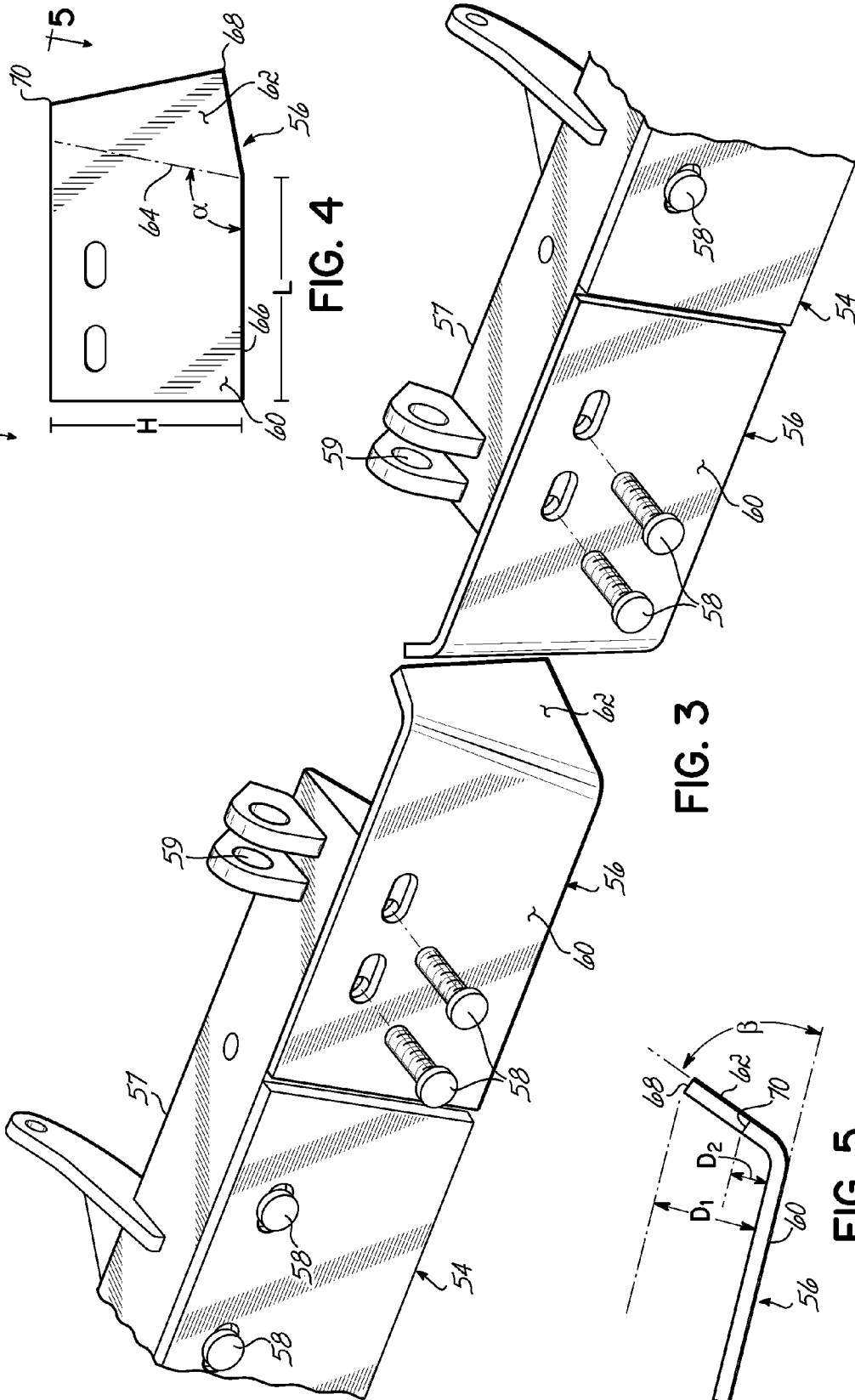


FIG. 3

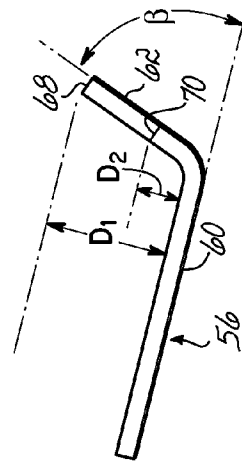


FIG. 5

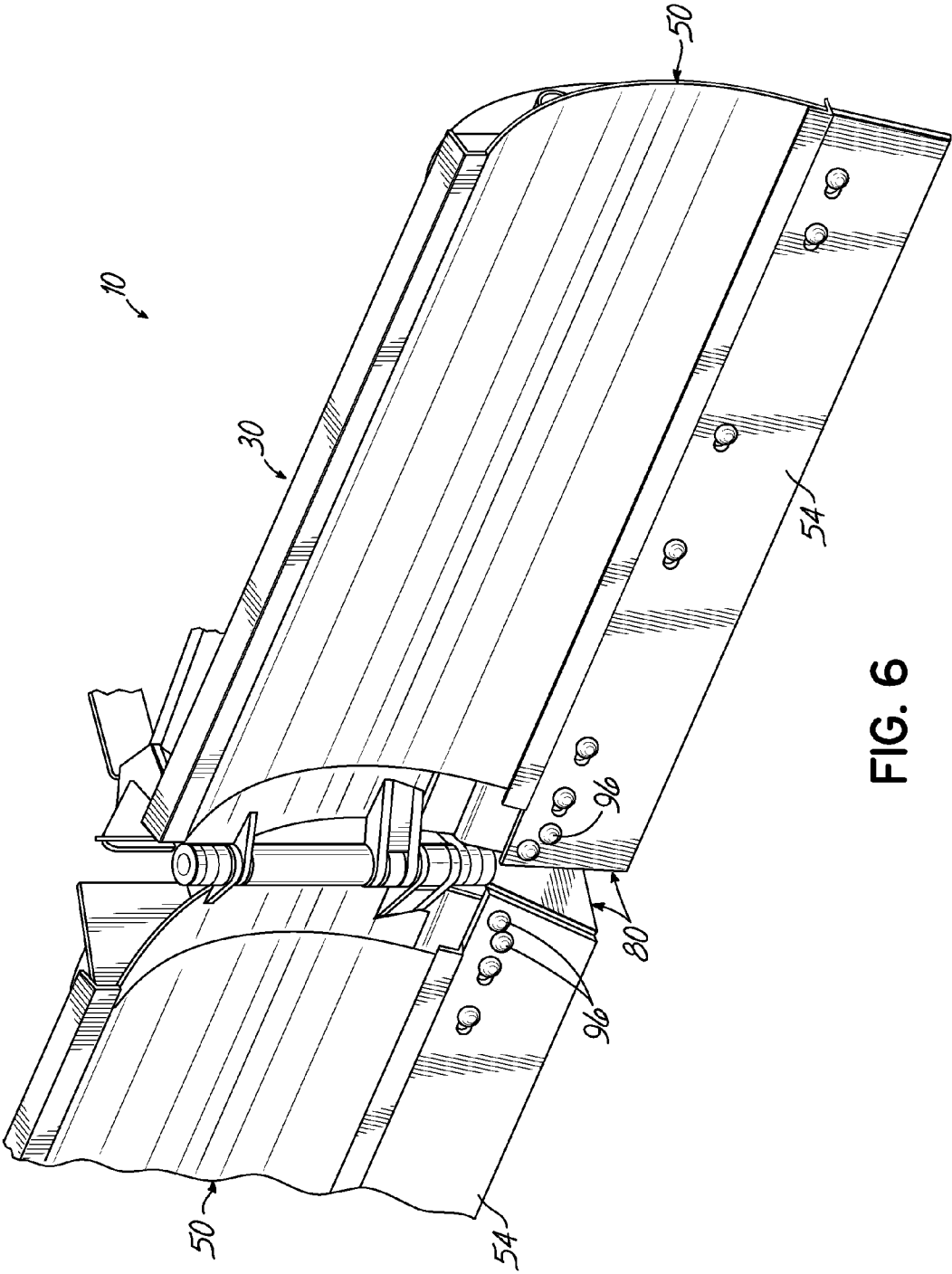


FIG. 6

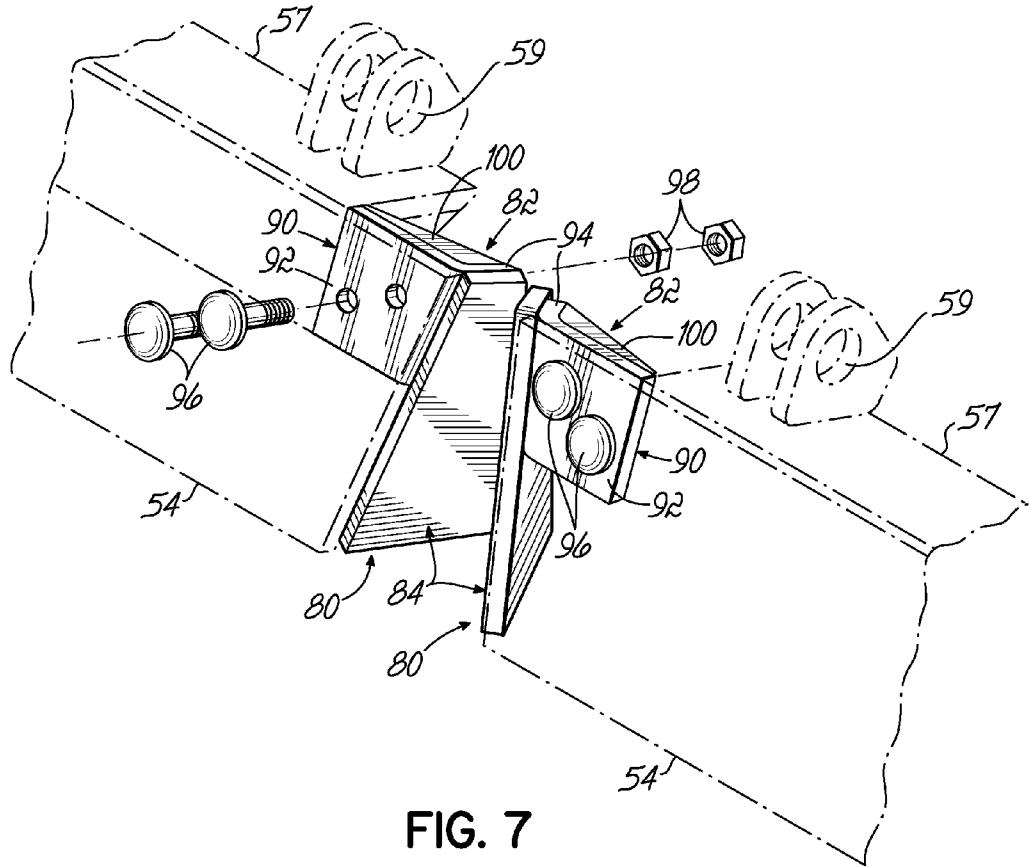


FIG. 7

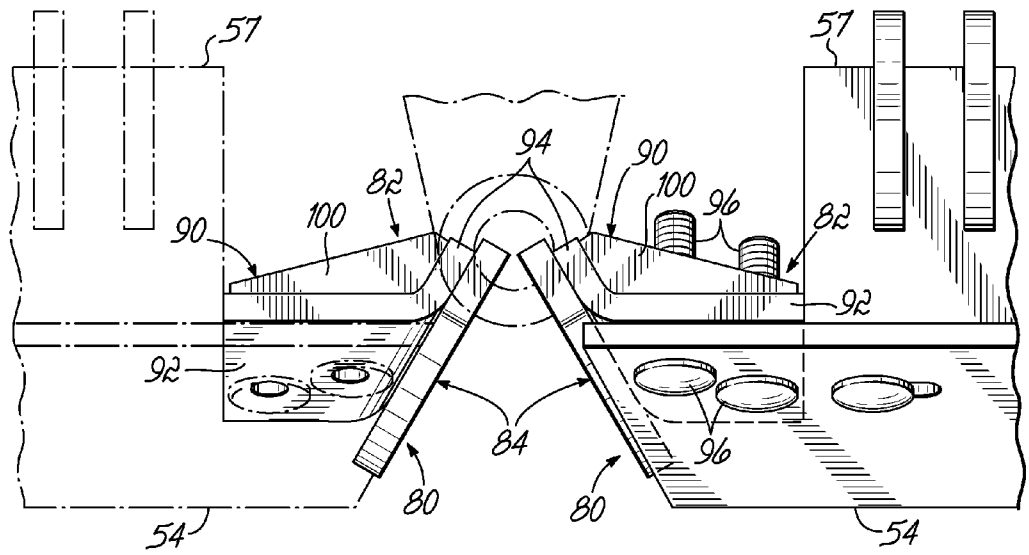


FIG. 8

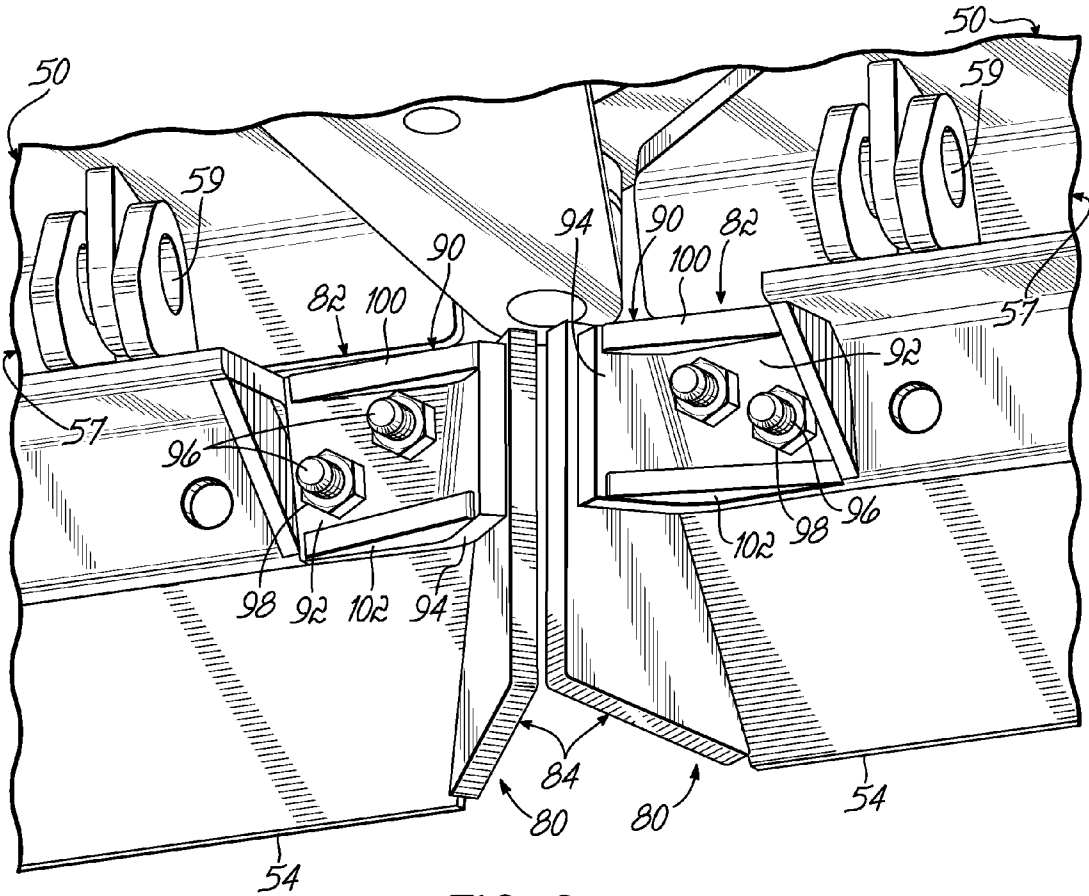


FIG. 9

V-BLADE SNOW PLOW WITH IMPROVED CUTTING EDGE

FIELD

[0001] This relates generally to plows and more particularly to vehicle mountable snow plows having a V-blade configuration.

BACKGROUND

[0002] Vehicle mounted snow plows currently in use are generally of either the single straight blade variety, or of the center-hinged dual blade variety known as V-blade plows, or simply V plows. A single straight blade plow can be oriented either straight ahead to push snow straight ahead, or pivoted to one side or the other to push snow to the desired side. In addition to these configurations, a V-blade plow can pivot its dual blades relative to each other, permitting a rearward sweeping V shaped configuration that pushes snow to both sides, and permitting a forward sweeping V shaped configuration for scooping snow and pushing it forward.

[0003] Both varieties of plow employ a consumable or sacrificial cutting edge which generally takes the form of a rectangular plate that is bolted to the lower edge of the plow blade. The cutting edge contacts the pavement surface being plowed with a scraping action. Consequently, the cutting edge must be periodically replaced as it wears away. Employing the use of a replaceable cutting edge thus prevents the entire plow blade from having to be replaced, resulting in a significant cost savings.

[0004] One disadvantage of V-blade plows is that due to the nature of the hinge connection of the dual blades, there is a gap between the inboard ends of the dual blades which results in a strip of unplowed snow being left behind as the vehicle moves forward.

[0005] The majority of the time V-blade plows are employed in their rearward sweeping V shaped configuration that pushes snow to both sides. In this configuration, it is the outboard ends of the cutting edges of the blades that wear away first, since they are subject to greater wear loading than are the inboard ends of the cutting edges of the blades. As such, another disadvantage of V-blade plows is that since the cutting edge of each of the blades does not wear uniformly along the length of the cutting edge, it becomes necessary to replace the entire cutting edge when only a portion of the length of the cutting edge (the outboard end) has worn away.

[0006] It is therefore desirable to improve upon current V-blade plows in use by providing an improved cutting edge for a V-blade plow which does not suffer from these drawbacks.

SUMMARY

[0007] In one aspect, a snow plow assembly comprises an A-frame assembly, a V-blade assembly pivoted to one end of the A-frame assembly, and a lift frame assembly pivoted to the other end of the A-frame assembly, the lift frame assembly adapted to be removably attached to a vehicle. The V-blade assembly comprises a pair of blades hinged together along inboard ends thereof, each blade of the pair of blades including first and second cutting edge plates removably secured to the blade, the first cutting edge plate fabricated of a first material, the second cutting edge plate fabricated of a second material, the first material having a greater resistance to abrasion wear than the second material.

[0008] The first cutting edge plate can be mounted to the blade outboard of the second cutting edge plate. The first and

second materials can be carbon steel, with the first material having a higher carbon content than the second material. The second material can be carbon steel in a range of about 1020 carbon steel to about 1045 carbon steel, and the first material can be carbon steel above about 1050 carbon steel. The second material can be 1044 carbon steel and the first material can be 1080 or 1090 carbon steel.

[0009] The second cutting edge plate can have a first outboard planar portion and a second inboard planar portion, with the first planar portion mounted to the blade, and the second planar portion extending rearwardly from the first planar portion. The second planar portion can intersect the first planar portion along a line which forms an angle of about 102 degrees relative to a lower edge of the first planar portion. The second planar portion can form an angle of about 62 degrees relative to the first planar portion when viewed from a plane that is perpendicular to the line. The first planar portion can be about 8 inches long and about 6 inches high, a lower trailing edge of the second planar portion can be about 3 inches from a rear surface of the first planar portion, and an upper trailing edge of the second planar portion can be about 1 inch from a rear surface of the first planar portion. The first and second planar portions can be about 0.5 inch thick.

[0010] The second cutting edge plate can have a first outboard portion and a second inboard planar portion. The first portion can be mounted to the blade, and the second portion can extend rearwardly from the first portion. The first portion can be mounted to a rear side of the blade. The first portion can comprise a bracket having a pair of legs, a first one of the legs being secured to the blade, a second one of the legs being secured to the second portion. The first one of the legs can be secured to the blade with bolts and nuts, and the second one of the legs can be secured to the second portion by welding. The bracket can include a pair of gussets, one of which is located at each edge of the bracket, and each of which is secured to the first and second legs of the bracket. The gussets can be secured to the first and second legs of the bracket by welding. The gussets can be generally triangularly shaped. The bracket can have a vertical extent which is less than a vertical extent of the second portion.

[0011] In another aspect, a cutting edge plate assembly adapted to be removably secured to a V-blade assembly of a snow plow comprises first and second cutting edge plates adapted to be removably secured to each blade of the V-blade assembly, the first cutting edge plate fabricated of a first material, the second cutting edge plate fabricated of a second material, the first material having a greater resistance to abrasion wear than the second material.

[0012] The highest wear portions of the cutting edges, the outboard portions, can thus be made of a higher carbon content steel than the inboard portions, to even out the wear rate along the entire length of the cutting edges. When the outboard portions have worn down to the point that they require replacement, the outboard portions can thus be replaced without replacing the entire cutting edges. The enhanced wear resistance, and replaceability, of the outboard portions, can thus be combined with a geometry of the inboard portions which does not leave a trail of unplowed snow behind.

DRAWINGS

[0013] FIG. 1 is a front perspective of a V-blade snow plow with improved cutting edge,

[0014] FIG. 2 is a front view of the V-blade with improved cutting edge of FIG. 1,

- [0015] FIG. 3 is an enlarged partial front perspective of the V-blade of FIGS. 1 and 2,
- [0016] FIG. 4 is a front view of the inboard cutting edge plate,
- [0017] FIG. 5 is a view taken along line 5-5 in FIG. 4,
- [0018] FIG. 6 is a front perspective view of a V-blade snow plow with alternative embodiment improved cutting edge,
- [0019] FIG. 7 is an enlarged partial front perspective view of the V-blade of FIG. 6,
- [0020] FIG. 8 is a top view of the V-blade of FIGS. 6 and 7, and
- [0021] FIG. 9 is an enlarged rear perspective view of the V-blade of FIGS. 6-8.

DESCRIPTION

[0022] Referring first to FIG. 1, a snow plow assembly 10 has an A-frame assembly 20, a V-blade assembly 30, and a lift frame assembly 40. The V-blade assembly 30 is pivotally connected to the A-frame assembly 20 on or near a front end of the A-frame assembly 20. The lift frame assembly 40 is pivotally connected to the A-frame assembly 20 on or near a rear end of the A-frame assembly 20. The lift frame assembly 40 is adapted to be removably attached to a vehicle (not shown) for mounting the snow plow assembly 10 to and supporting the snow plow assembly 10 from the vehicle. Other configurations of A-frame assembly 20, V-blade assembly 30, and/or lift frame assembly 40 can be employed.

[0023] Referring now to FIGS. 2 and 3, the V-blade assembly 30 comprises a pair of blades 50, 50 hinged together along inboard ends thereof as at 52. Each blade 50 of the pair of blades includes first 54 and second 56 cutting edge plates removably secured to the blade 50, as by bolts 58. The first cutting edge plate 54 is mounted to the blade 50 outboard of the second cutting edge plate 56. The first cutting edge plate 54 is fabricated of a first material, and the second cutting edge plate is fabricated of a second material. The first material has a greater resistance to abrasion wear than does the second material. The first and second materials can be carbon steel, with the first material having a higher carbon content than the second material. The second material can be carbon steel in the range of about 1020 carbon steel to about 1045 carbon steel, and the first material can be carbon steel above about 1050 carbon steel. One possible combination is for the second material to be 1044 carbon steel and the first material to be 1080 carbon steel. Another possible combination is for the second material to be 1044 carbon steel and the first material to be 1090 carbon steel.

[0024] The second cutting edge plate 56 can have a first planar portion 60 and a second planar portion 62, the first planar portion 60 mounted to the blade 50, the second planar portion 62 extending rearwardly from the first planar portion 60. The second planar portion 62 can intersect the first planar portion 60 along a line 64, for example bend line, which forms an angle α of about 102 degrees relative to a lower edge 66 of the first planar portion 60. See FIG. 4. When viewed from a plane which is perpendicular to line 64, second portion 62 forms an angle β of about 62 degrees relative to the first planar portion 60. See FIG. 5. The first planar portion 60 can have a length dimension L of about 8 inches, and a height dimension H of about 6 inches. Trailing lower edge 68 of second planar portion 62 can have a dimension D1 of about 3 inches from a rear surface of the first planar portion 60. Trailing upper edge 70 of second planar portion 62 can have a dimension D2 of about 1 inch from a rear surface of the first planar portion 60. First and second planar portions 60 and 62 can be about 0.5

inch thick, whereas first cutting edge plate 54 can be from about 0.375 inch thick up to about 0.5 inch thick.

[0025] Referring now to FIGS. 6-9, an alternative embodiment of the second cutting edge plate 80 is illustrated. It can have a first outboard portion 82 and a second inboard planar portion 84. The basic geometry of the alternative embodiment second cutting edge plate 80 is generally the same as that of the FIGS. 1-5 embodiment. The first portion 82 can be mounted to the blade 50, and the second portion 84 can extend rearwardly from the first portion 82 in the manner generally depicted in FIGS. 4 and 5. The first portion 82 can be mounted to a rear side of the blade 50. The first portion 82 can comprise a bracket 90 having a pair of legs 92 and 94, a first one 92 of the legs being secured to the blade 50, a second one 94 of the legs being secured to the second portion 84. The first one 92 of the legs can be secured to the blade 50 with bolts 96 and nuts 98, and the second one 94 of the legs can be secured to the second portion 84 by welding. The bracket 90 can include a pair of gussets 100 and 102, one of which is located at each edge of the bracket 90, and each of which is secured to the first 92 and second 94 legs of the bracket 90. The gussets 100 and 102 can be secured to the first and second legs 92 and 94 of the bracket 90 by welding. The gussets 100 and 102 can be generally triangularly shaped. The bracket 90 can have a vertical extent which is less than a vertical extent of the second portion 84.

[0026] The embodiments shown and described are merely for illustrative purposes only. The drawings and the description are not intended to limit in any way the scope of the claims. Those skilled in the art will appreciate various changes, modifications, and alternative embodiments. All such changes, modifications, and embodiments are deemed to be embraced by the claims. Accordingly, the scope of the right to exclude shall be limited only by the following claims and their equivalents.

What is claimed is:

1. A snow plow assembly comprising:

- an A-frame assembly,
 - a V-blade assembly pivoted to one end of said A-frame assembly, and
 - a lift frame assembly pivoted to the other end of said A-frame assembly, said lift frame assembly adapted to be removably attached to a vehicle,
- said V-blade assembly comprising:
- a pair of blades hinged together along inboard ends thereof, each blade of said pair of blades including first and second cutting edge plates removably secured to said blade,
 - said first cutting edge plate fabricated of a first material,
 - said second cutting edge plate fabricated of a second material,
 - said first material having a greater resistance to abrasion wear than said second material.

2. The snow plow assembly of claim 1 wherein said first cutting edge plate is mounted to said blade outboard of said second cutting edge plate.

3. The snow plow assembly of claim 2 wherein said first and second materials are carbon steel, and wherein said first material has a higher carbon content than said second material.

4. The snow plow assembly of claim 3 wherein said second material is carbon steel in a range of about 1020 carbon steel to about 1045 carbon steel, and said first material is carbon steel above about 1050 carbon steel.

5. The snow plow assembly of claim 4 wherein said second material is 1044 carbon steel and said first material is 1080 carbon steel.

6. The snow plow assembly of claim 4 wherein said second material is 1044 carbon steel and said first material is 1090 carbon steel.

7. The snow plow assembly of claim 2 wherein said second cutting edge plate has a first outboard planar portion and a second inboard planar portion, said first planar portion mounted to said blade, said second planar portion extending rearwardly from said first planar portion.

8. The snow plow assembly of claim 7 wherein said second planar portion intersects said first planar portion along a line which forms an angle of about 102 degrees relative to a lower edge of said first planar portion.

9. The snow plow assembly of claim 8 wherein said second planar portion forms an angle of about 62 degrees relative to said first planar portion when viewed from a plane that is perpendicular to said line.

10. The snow plow assembly of claim 9 wherein said first planar portion is about 8 inches long and about 6 inches high, a lower trailing edge of said second planar portion is about 3 inches from a rear surface of said first planar portion, and an upper trailing edge of said second planar portion is about 1 inch from a rear surface of said first planar portion.

11. The snow plow assembly of claim 10 wherein said first and second planar portions are about 0.5 inch thick.

12. A cutting edge plate assembly adapted to be removably secured to a V-blade assembly of a snow plow, said cutting edge plate assembly comprising:

- first and second cutting edge plates adapted to be removably secured to each blade of the V-blade assembly,
- said first cutting edge plate fabricated of a first material,
- said second cutting edge plate fabricated of a second material,
- said first material having a greater resistance to abrasion wear than said second material.

13. The cutting edge plate assembly of claim 12 wherein said first cutting edge plate is mounted to said blade outboard of said second cutting edge plate.

14. The cutting edge plate assembly of claim 13 wherein said first and second materials are carbon steel, and wherein said first material has a higher carbon content than said second material.

15. The cutting edge plate assembly of claim 14 wherein said second material is carbon steel in a range of about 1020 carbon steel to about 1045 carbon steel, and said first material is carbon steel above about 1050 carbon steel.

16. The cutting edge plate assembly of claim 15 wherein said second material is 1044 carbon steel and said first material is 1080 carbon steel.

17. The cutting edge plate assembly of claim 15 wherein said second material is 1044 carbon steel and said first material is 1090 carbon steel.

18. The cutting edge plate assembly of claim 13 wherein said second cutting edge plate has a first outboard planar portion and a second inboard planar portion, said first planar portion mounted to said blade, said second planar portion extending rearwardly from said first planar portion.

19. The cutting edge plate assembly of claim 18 wherein said second planar portion intersects said first planar portion along a line which forms an angle of about 102 degrees relative to a lower edge of said first planar portion.

20. The cutting edge plate assembly of claim 19 wherein said second planar portion forms an angle of about 62 degrees

relative to said first planar portion when viewed from a plane that is perpendicular to said line.

21. The cutting edge plate assembly of claim 20 wherein said first planar portion is about 8 inches long and about 6 inches high, a lower trailing edge of said second planar portion is about 3 inches from a rear surface of said first planar portion, and an upper trailing edge of said second planar portion is about 1 inch from a rear surface of said first planar portion.

22. The cutting edge plate assembly of claim 21 wherein said first and second planar portions are about 0.5 inch thick.

23. The snow plow assembly of claim 2 wherein said second cutting edge plate has a first outboard portion and a second inboard planar portion, said first portion mounted to said blade, said second portion extending rearwardly from said first portion.

24. The cutting edge plate assembly of claim 12 wherein said second cutting edge plate has a first outboard portion and a second inboard planar portion, said first portion mounted to said blade, said second portion extending rearwardly from said first portion.

25. The assembly of claim 23 or claim 24 wherein said first portion is mounted to a rear side of said blade.

26. The assembly of claim 25 wherein said first portion comprises a bracket having a pair of legs, a first one of said legs being secured to said blade, a second one of said legs being secured to said second portion.

27. The assembly of claim 26 wherein said first one of said legs is secured to said blade with bolts and nuts, and said second one of said legs is secured to said second portion by welding.

28. The assembly of claim 27 wherein said bracket includes a pair of gussets, one of which is located at each edge of said bracket, and each of which is secured to said first and second legs of said bracket.

29. The assembly of claim 28 wherein said gussets are secured to said first and second legs of said bracket by welding.

30. The assembly of claim 28 wherein said gussets are generally triangularly shaped.

31. The assembly of claim 30 wherein said bracket has a vertical extent which is less than a vertical extent of said second portion.

32. The assembly of claim 1 wherein said first and second cutting edge plates are removably secured to a trip cutting edge mounting structure, said trip cutting edge mounting structure being pivoted to said blade.

33. The assembly of claim 1 wherein said first cutting edge plate is removably secured to a trip cutting edge mounting structure, said trip cutting edge mounting structure being pivoted to said blade, and wherein said second cutting edge plate is removably secured to said first cutting edge plate.

34. The assembly of claim 12 wherein said first and second cutting edge plates are adapted to be removably secured to a trip cutting edge mounting structure that is pivoted to the blade.

35. The assembly of claim 12 wherein said first cutting edge plate is adapted to be removably secured to a trip cutting edge mounting structure that is pivoted to the blade, and wherein said second cutting edge plate is removably secured to said first cutting edge plate.

* * * * *