Claims

1. A grapple-splitter for tree trunk clearing, the grapple-splitter comprising
at least one jaw that is movable for grappling a trunk;
wherein the at least one jaw further comprises at least one sharp edge for tearing the tree trunk apart.

2. The grapple-splitter of claim 1, wherein
the at least one jaw comprises a base for supporting the at least one jaw; and an extremity having the at least one sharp edge at an opposite end/side of the base.

3. The grapple-splitter of claim 2, wherein
the extremity comprises at least one prong that comprises the at least one sharp edge and extends away from the base.

4. The grapple-splitter of claim 3, wherein the at least one jaw comprises
- a primary jaw having a primary base and a primary extremity at opposite ends of the primary jaw;
- an appendage jaw movably attached to the primary jaw, the appendage jaw having an appendage base and an appendage extremity at opposite ends of the appendage jaw.

5. The grapple-splitter of claim 4, wherein
the at least one primary prong comprises a first primary prong and a second primary prong,
wherein the at least one primary prong has a primary gap between the first primary prong and the second primary prong for receiving at least a portion of the appendage jaw.

6. The grapple-splitter of claim 5, wherein
the primary jaw comprises a primary rib connecting the first primary prong and the second primary prong for increasing stiffness of the primary jaw, the first primary prong, the second primary prong or a combination of these.

7. The grapple-splitter of claim 6, wherein
the primary rib comprises at least one plate, at least one shaft or a combination of both.

8. The grapple-splitter of claim 6, wherein
the primary rib is located away from the primary extremity for limiting a range of movement of the appendage jaw with respect to the primary jaw.

9. The grapple-splitter of claim 4, wherein
the primary base comprises a primary holder for being fastened to a boom.

10. The grapple-splitter of claim 9, wherein
the primary holder comprises at least one primary hinge for allowing movable of the primary jaw.

11. The grapple-splitter of claim 10, wherein
the at least one primary hinge comprises a first primary hinge and a second primary hinge that have a gap in-between.

12. The grapple-splitter of claim 5, wherein
the at least one primary prong further comprises a third primary prong that is situated between the first primary prong and the second primary prong.

13. The grapple-splitter of claim 12, wherein
ends of the first primary prong, the second primary prong and the third primary prong are not aligned.

14. The grapple-splitter of any of the preceding claims, wherein
the primary jaw comprises a primary wedge having a narrow end at the primary extremity.

15. The grapple-splitter of claim 14, wherein
the sharp edge, the primary wedge or both are detachable.

16. The grapple-splitter of claim 4, wherein
the appendage jaw comprises at least one appendage prong extending between the appendage base and the appendage extremity.

17. The grapple-splitter of claim 16, wherein
the at least one appendage prong is configured to move in a plane that is substantially different from that of the primary prong.

18. The grappler-splitter of claim 3, wherein
the at least one jaw comprises
- a left jaw having a first confronting face; and
- a right jaw opposed to the left jaw and having a second confronting face; wherein the left jaw and the right jaw are configured to pivot on a pin for breaking the felled tree.

19. The grappler-splitter of claim 18, wherein
the left jaw comprises
- a first left claw and a second left claw connected to the pin;
- a third left claw between the first left claw and the second left claw; and
- a left supporting part connecting the first left claw, the second left claw and the third left claw.

20. The grappler-splitter of claim 19, wherein
the first left claw, the second left claw and the third left claw are arranged in a parallel configuration.

21. The grappler-splitter of claim 19, wherein
the first left claw and the third left claw have a substantially same length; and
the second left claw has a shorter length than the first left claw and the third left claw.

22. The grappler-splitter of claim 19, wherein
the first left claw comprises
- a first left arm connected to the pin;
- a first left adapter connected to the first left arm opposite to the pin; and
- a first left tip connected to the first left adapter opposite to the first left arm; wherein the first left tip has a first left edge that is sharp for breaking the felled tree.

23. The grappler-splitter of claim 22, wherein
the first left arm has a first through hole at a first top end, wherein the first adapter is connected to a first bottom end opposite to the first top end.

24. The grappler-splitter of claim 22, wherein
the first left tip is configured to be detachable from the first left adapter.

25. The grappler-splitter of claim 22, wherein
the first left adapter is configured to be detachable from the left first arm.

26. The grappler-splitter of claim 22, wherein
the first left tip comprises a harder material than the felled tree.

27. The grappler-splitter of claim 22, wherein
the first left tip comprises a smooth surface for cleaving the felled tree along its specific wood texture.

28. The grappler-splitter of claim 22, wherein
the first left tip has a tapered configuration in an inclined plane.

29. The grappler-splitter of claim 28, wherein
the first left tip has a diminished configuration in a lateral plane vertical to the inclined plane.

30. The grappler-splitter of claim 29, wherein
the diminished configuration has at least one pointed edge for piercing into the felled tree.

31. The grappler-splitter of claim 29, wherein
the diminished configuration has a substantially linear edge for cutting off the felled tree.

32. The grappler-splitter of claim 19, wherein
the second left claw comprises
- a second left arm connected to the pin;
- a second left adapter connected to the second left arm opposite to the pin; and
- a second left tip connected to the second left adapter opposite to the second left arm;

wherein the second left tip has a second left edge that is sharp for breaking the felled tree.

33. The grappler-splitter of claim 32, wherein
the second left arm has a second left through hole at a second top end; and
the second left adapter is connected to a second bottom end opposite to the second top end.

34. The grappler-splitter of claim 19, wherein
the left jaw further comprises a left spacer connected to the first left claw and the second left claw.

35. The grappler-splitter of claim 35, wherein
the left spacer comprises
- a first left spacer connected to an inner side of the first left arm, wherein the first left spacer has a first left opening aligned with the first left through hole; and
- a second left spacer connected to an inner side of the second left arm, wherein the second left spacer has a second left opening aligned with the second left through hole.

36. The grappler-splitter of claim 19, wherein
the third left claw comprises
- a third left arm connected to the left supporting part;
- a third left adapter connected to the third left arm; and
- a third left tip connected to the third left adapter opposite to the third left arm; wherein the third left tip has a third left edge that is shape for breaking the felled tree.

37. The grappler-splitter of claim 19, wherein
- the first left claw has a first left tip for providing a first splitting point;
- the second left claw has a second left tip for providing a second splitting point; and
- the third left claw has a third left tip for providing a third splitting point;
wherein the first left tip, the second left tip and the third left tip are arranged in a triangular configuration.

38. The grappler-splitter of claim 19, wherein
the left supporting part comprises
- a first plate below the pin;
- a second plate connected to the first plate;
- a left cylinder connected to the second plate;
- a third plate embedded in the left cylinder; and
- a fourth plate connected to the left cylinder.

39. The grappler-splitter of claim 38, wherein
the left cylinder comprises
- a first left cylinder connected between the second plate and the third plate; and
- a second left cylinder connected between the third plate and the fourth plate.

40. The grappler-splitter of claim 38, wherein
the left supporting part further comprises a top flange and a bottom flange connected to the first left arm and the second left arm,
wherein the top flange is on/over the bottom flange.

41. The grappler-splitter of claim 40, wherein
the top flange comprises
- a first top flange for connecting the fourth plate and the first left arm near the first left tip; and
- a second top flange for connecting the fourth plate and the second left arm near the second left tip.

42. The grappler-splitter of claim 41, wherein
the bottom flange comprises
- a first bottom flange beneath/under the first top flange for connecting the fourth plate and the firs left arm near the left tip; and
- a second bottom flange beneath the first top flange for connecting the fourth plate and the second left arm near the second left tip.

43. The grappler-splitter of claim 38, wherein
the left jaw further comprises a left bracket for connecting to an excavator.

44. The grappler-splitter of claim 43, wherein
the left bracket comprises
- a first left bracket connected to a first portion of the left supporting part; and
- a second left bracket connected to a second portion of the left supporting part.

45. The grappler-splitter of claim 44, wherein
the first left bracket and the second left bracket have a first left aperture and a second left aperture respectively.

46. The grappler-splitter of claim 45, wherein
- the first left bracket has a first washer on an outside surface facing the first left arm; and
- the second left bracket has a second left washer on an outside surface facing the second left arm;

wherein the first washer and the second washer are aligned to the first left aperture and the second left aperture respectively.

47. The grappler-splitter of claim 18, wherein
the right jaw comprises
- a first right claw and a second right claw connected to the pin; and
- a right supporting part connecting the first right claw and the second right claw.

48. The grappler-splitter of claim 47, wherein
the first right claw and the second right claw are arranged in a parallel configuration.

49. The grappler-splitter of claim 47, wherein
the first right claw comprises
- a first right arm connected to the pin;
- a first right adapter connected to the first right arm opposite to the pin; and
- a first right tip connected to the first right adapter opposite to the first right arm;

wherein the first right tip has a first right edge that is sharp for breaking the felled tree.

50. The grappler-splitter of claim 49, wherein
the first right arm has a first right through hole at a top end of the first right arm, wherein the first right adapter is connected to a bottom end opposite to the top end of the first right arm.

51. The grappler-splitter of claim 50, wherein
the first right tip has a tapered configuration in an inclined plane.

52. The grappler-splitter of claim 47, wherein
the second right claw comprises
- a second right arm connected to the pin;
- a second right adapter connected to the second right arm opposite to the pin; and
- a second right tip connected to the second right adapter opposite to the second right arm;

wherein the second right tip has a second right edge that is sharp for breaking the felled tree.

53. The grappler-splitter of claim 52, wherein
the second right arm has a second right through hole at a top end of the second right arm; while the second right adapter is connected to a bottom end opposite to the top end of the second right arm.

54. The grappler-splitter of claim 47, wherein
the right supporting part comprises
- a fifth plate below the pin;
- a sixth plate connected to the fifth plate;
- a right cylinder connected to the sixth plate;
- a seventh plate embedded in the right cylinder; and
- an end plate connected to the right cylinder.

55. The grappler-splitter of claim 54, wherein
the right cylinder comprises
- a first right cylinder connected to the sixth plate and the seventh plate; and
- a second right cylinder connected to the seventh plate and the end plate.

56. The grappler-splitter of claim 47, wherein
the right jaw further comprises a right bracket for connecting to an excavator.

57. The grappler-splitter of claim 56, wherein
the right bracket comprises
- a first right bracket connected to the first right claw; and
- a second right bracket connected to the second right claw.

58. The grappler-splitter of claim 57, wherein
the first right bracket and the second right bracket have a first right aperture and a second right aperture respectively.

59. The grappler-splitter of claim 57, wherein
the right jaw comprises a right spacer connected to the first right claw and the second right claw.

60. The grappler-splitter of claim 59, wherein
the right spacer comprises
- a first right spacer connected to an outer side of the first right arm, wherein the first right spacer has a first right opening aligned with the first right through hole; and
- a second right spacer connected to an outer side of the second right arm, wherein the second right spacer has a second right opening aligned with the second right through hole.

61. The grappler-splitter of claim 56, wherein
the right bracket comprises a bracket spacer at an inner surface of the first right bracket.

62. The grappler-splitter of claim 61, wherein
the bracket spacer comprises
- a first bracket spacer at an inner surface of the first right bracket and aligned with the first right aperture; and
- a second bracket spacer at an inner surface of the second right bracket and aligned with the second right aperture.

63. The grappler-splitter of claim 56, wherein
the right bracket comprises a bracket cylinder at an outside surface of the right bracket.

64. The grappler-splitter of any preceding claims, further comprising
a driving mechanism for moving the left jaw, the right jaw or both.

65. The grappler-splitter of claim 64, wherein
the driving mechanism comprises a first driving part connected to a left axle for opening or closing the left jaw.

66. The grappler-splitter of claim 65, wherein
the driving mechanism comprises a second driving part connected to a right axle for opening or closing the right jaw.

67. The grappler-splitter of claim 66, further comprising
a control panel for controlling the diving mechanism.

68. A method of making a grappler-splitter for breaking a felled tree, comprising:
- providing a left jaw having a first confronting face;
- providing a right jaw having a second confronting face; and
- providing a pin for connecting and supporting the left jaw and the right jaw;
wherein the left jaw and the right jaw are configured to pivot on the pin for gripping and breaking the felled tree.

69. The method of claim 68, wherein
the left jaw is provided by
- providing a first left claw, a second left claw and a third left claw;
- assembling the first left claw, the second left claw and the third left claw by a left supporting part into a unitary component; and
- connecting a left bracket to the left supporting part.

70. The method of claim 68, wherein
the left jaw is provided by
- providing a first main body comprising a first left claw, a second left claw, a third left claw and a left supporting part; and
- connecting a left bracket to the left supporting part.

71. The method of claim 69 or 70, wherein
the first left claw is provided by
- providing a first left arm having a first left through hole;
- connecting a first left adapter to the first left arm; and
- connecting a first left tip to the first left adapter.

72. The method of claim 69 or 70, wherein
the third left claw is provided by
- connecting a third left arm to the left supporting part;
- connecting a third left adapter to the third left arm; and
- connecting a third tip to the third left adapter.

73. The method of claim 68, wherein
the first right jaw is provided by
- providing a first right claw and a second right claw;
- assembling the first right claw and the second right claw into a unitary component; and
- connecting a right bracket to the first right claw and the second right claw.

74. The method of claim 68, wherein
the second right jaw is provided by
- providing a second main body comprising a first right claw, a second right claw and a right supporting part; and
- connecting a right bracket to the first right claw and the second right claw.

75. The method of claim 73 or 74, wherein
the first right claw is provided by
- providing a first right arm having a first left through hole;
- connecting a first right adapter to the first right arm; and
- connecting a first right tip to the first right adapter.

76. The method of claim 68, further comprising
- providing a driving mechanism for driving the left jaw, the right jaw or both; and
- connecting a driving mechanism to the left jaw, the right jaw or both.

77. The method of claim 75, wherein
the driving mechanism is provided by
- connecting a first driving part to the left jaw for moving the left jaw; and
- connecting a second driving part to the right jaw for moving the right jaw.

78. A method of using a grappler-splitter to break a felled tree, comprising the steps of:
- moving a left jaw and a right jaw downwardly;
- opening the left jaw and the right jaw apart;
- approaching the grappler-splitter to the felled tree;
- closing the left jaw and the right jaw towards the felled tree; and
- gripping and destroying the felled tree by the left jaw and the right jaw.

79. The method of claim 78, wherein
the opening step comprises pivoting both the left jaw on a pin, wherein a first confronting surface of the left jaw is actively moved from a second confronting surface of the right jaw.

80. The method of claim 78, wherein
the opening step comprises pivoting the left jaw and the right jaw on a pin, wherein a first confronting surface of the left jaw and a second confronting surface of the right jaw are moved away from each other simultaneously.

81. The method of claim 78, wherein
the closing step comprises pivoting the left jaw on a pin,
wherein a first confronting surface of the left jaw is actively moved towards a second confronting surface of the right jaw.

82. The method of claim 78, wherein
the gripping and destroying step comprises the steps of
- fixing the felled tree with the right jaw; and
- breaking the felled tree with the left jaw.

83. The method of claim 82, wherein
the breaking step comprises
- piercing the felled tree with the left jaw;
- splitting the felled tree into several large blocks with the left jaw; and
- breaking the large blocks into multiple small pieces with the left jaw.

84. The method of claim 82, wherein
the breaking step comprises cutting the felled tree into multiple small slices.

85. The method of claim 78, wherein
the closing step comprises pivoting the left jaw and the right jaw on a pin, wherein a first confronting surface of the left jaw and a second confronting surface of the right jaw are driven towards each other simultaneously.

86. The method of claim 78, wherein
the gripping and destroying step comprises the steps of
- fixing the felled tree with the both the left jaw and the right jaw; and
- breaking the felled tree with both the left jaw and the right jaw.

87. The method of claim 86, wherein
the breaking step comprises
- piercing the felled tree with both the left jaw and the right jaw;
- splitting the felled tree into several large blocks with both the left jaw and the right jaw; and
- breaking the large blocks into multiple small pieces with both the left jaw and the right jaw.

Claims

1. A grapple-splitter for a felled tree clearing, the grapple-splitter comprising
a first jaw and a second jaw, and the first jaw being movable for grappling a woody material;
wherein the first jaw comprises a primary base for supporting the first jaw; and a primary extremity locating at an opposite end/side of the primary base,
the first jaw comprises a first primary prong and a second primary prong including the primary extremity and extending away from the primary base,
each of the first primary prong and the second primary prong has a sharp edge at an end/side of the primary extremity for tearing the felled tree apart into the woody material,
the first jaw and the second jaw are configured to pivot for breaking the felled tree, and
a cavity is configured to be provided between the first jaw and the second jaw for grappling the woody material, wherein the cavity is provided to pass completely through to the other side in the axial direction of a pin for pivoting the first jaw or the second jaw in a configuration where both sharp edges of the first primary prong and the second primary prong overlap the second jaw, in the axial view of the pin.

2. A grapple-splitter of claim 1, wherein
a primary rib connecting the first primary prong and the second primary prong, and
the primary rib inhibits the first jaw and the second jaw from fully closing.

3. A grapple-splitter of claim 1 or 2, wherein
a primary gap is provided between the first primary prong and the second primary prong for receiving at least a portion of the second jaw.