CLAIMS

1. A percussion apparatus comprising:

a reciprocating component producing an axial impact on a rotating component, the reciprocating component housed in a cylinder;

a sliding selector comprising a resilient member applying a continuous force biasing a selection piston toward a default setting, the default setting corresponding to a first stroke length and a first frequency of the reciprocating component;

wherein the sliding selector changes the first stroke length and the first frequency in response to a feed forward pressure when the feed forward pressure exceeds a threshold value, the threshold value corresponding to a value of the continuous force that the resilient member acts on the selection piston, to allow for selecting an operation setting of a second stroke length and a second frequency; wherein the first stroke length and the first frequency produce a cyclic stress level lower than a fatigue stress level; and the second stroke length and the second frequency produce a cyclic stress level greater than the fatigue stress level.

2. The percussion apparatus of claim 1, further comprising a primary housing enclosing the selection piston and a secondary housing enclosing at least a portion of the resilient member, wherein the secondary housing is affixed to the primary housing.

3. The percussion apparatus of claim 2, wherein the primary housing has a plurality of control ports hydraulically connected to the cylinder of the reciprocating component.

4. The percussion apparatus of claim 1, further comprises a pressure relief valve for limiting the feed forward pressure.

5. The percussion apparatus of claim 1, wherein the percussion apparatus is a hammer drill and the reciprocating component is a hydraulically actuated hammer piston.

6. The percussion apparatus of claim 1, wherein the first stroke length is shorter than the second stroke length and the first frequency is correspondingly higher than the second frequency.

7. The percussion apparatus of claim 6, wherein the sliding selector is operable to further select a third stroke length and a third frequency, the third stroke length has a value between the first and the second stroke lengths, and the third frequency has a value between the first and the second frequencies.

8. A percussion apparatus comprising:

a reciprocating component producing an axial impact on a rotating component, the reciprocating component housed in a cylinder;

a sliding selector comprising a resilient member applying a continuous force biasing a selection piston toward a default setting, the default setting corresponding to a first stroke length and a first frequency of the reciprocating component;

wherein the sliding selector changes the first stroke length and the first frequency in response to a feed forward pressure when the feed forward pressure exceeds a threshold value, the threshold value corresponding to a value of the continuous force that the resilient member acts on the selection piston, to allow for selecting an operation setting of a second stroke length and a second frequency, wherein the feed forward pressure is in response to an operation of the percussion apparatus and wherein the feed forward pressure increases when the percussion apparatus presses against a target surface.

9. The percussion apparatus of claim 8, further comprising a primary housing enclosing the selection piston and a secondary housing enclosing at least a portion of the resilient member, wherein the secondary housing is affixed to the primary housing.

10. The percussion apparatus of claim 9, wherein the primary housing has a plurality of control ports hydraulically connected to the cylinder of the reciprocating component.

11. The percussion apparatus of claim 1, further comprises a pressure relief valve for limiting the feed forward pressure.

12. The percussion apparatus of claim 8, wherein the percussion apparatus is a hammer drill and the reciprocating component is a hydraulically actuated hammer piston.

13. The percussion apparatus of claim 8, wherein the first stroke length and the first frequency produce a cyclic stress level lower than a fatigue stress level; and the second stroke length and the second frequency produce a cyclic stress level greater than the fatigue stress level.

14. The percussion apparatus of claim 13, wherein the first stroke length is shorter than the second stroke length and the first frequency is correspondingly higher than the second frequency.

15. The percussion apparatus of claim 14, wherein the sliding selector is operable to further select a third stroke length and a third frequency, the third stroke length has a value between the first and the second stroke lengths, and the third frequency has a value between the first and the second frequencies.