CLAIMS:

1. A method for cutting a slab of material to effect removal of a part thereof including cutting the slab with a cutting tool vibrating at a preselected frequency when the material is in a semi-set state and wherein the cutting tool is a blade.

2. A method according to claim 1 wherein the slab material is cementitious and the constituent materials include cement with other materials where the combined mixture has particle sizes sufficiently small to allow the slab material to be cut with the vibrating cutting tool.

3. A method according to claim 2 wherein the cementitious material is poured into a mould and subsequently allowed to cure to a semi-set state being a state that is sufficiently cured to allow the cutting tool to separate the slab without the material deforming either during or subsequent to the operation of the cutting tool.

4. A method according to claim 1 wherein the slab material is non-cementitious and the constituent materials subsequent to mixing are relatively dry, the mixture is pressed into a mould and heated to render the material to a semi-set state prior to cutting the slab.

5. A method according to claim 1 wherein the slab material is gypsum and wherein the gypsum slab material is lined with a cellulous material both of which are cut with the cutting tool whilst the gypsum material is in a semi-set state.

6. A method according to any one of the preceding claims wherein the pre-selected frequency of the vibrating cutting tool is an ultrasonic frequency.

7. A method according to any one of the preceding claims wherein the frequency of vibration may be selected to best suit the constituent material of the slab.

8. A method according to any one of claims 1 to 7 wherein the cutting tool is a curved blade.

9. A method according to any one of the preceding claims wherein the cutting tool is maneuvered under the direction of a control system including a micro-processor and a memory for storing instructions such that the position and movement of the cutting tool is determined by the stored instructions executed by the micro-processor.

10. A method according to any one of the preceding claims wherein the slab material in a semi-set state is disposed substantially horizontally and the cutting tool is a straight blade that is maneuvered under the direction of a control system such that the vibrating blade passes through the slab material cutting same at desired locations.

11. A method according to either claim 9 or claim 10 wherein the blade is disposed at an angle other than perpendicular to the surface of the slab of material thus allowing portions of the slab to be separated with an angled cut.

12. A method according to any one of the preceding claims wherein a plurality of cutting tools are used when cutting a slab of material, the most appropriate cutting tool being selected according to the cutting requirement for a particular region of the slab of material.

13. A method according to any one of the preceding claims wherein cutting the slab of material includes removing a fine layer of material from any one or more of the surfaces of the slab of material.

14. A method according to any one of the preceding claims wherein the slab material is cementitious and the mould is formed from a substrate with a malleable material applied thereto thus forming mould walls to retain poured slab material within the mould, said malleable material capable of separation by the vibrating cutting tool during the cutting of the slab material in a semi-set state.

15. A slab product separated from a slab of material according to a method claimed in any one of the preceding claims.

16. A cutting apparatus when used to cut a slab of material in a semi-set state including a vibrating blade, a micro-processor and a memory that stores instructions operably connected thereto, the location of the blade being determined by the stored instructions, said micro-processor executing the stored instructions thus directing the control system to pass the vibrating cutting blade through the slab of material to effect removal of a part of the slab material.

17. A cutting apparatus according to claim 16 wherein the control system selects the frequency of vibration of the blade.

18. A cutting apparatus according to claim 17 wherein the control system selects an ultrasonic frequency for vibration of the blade.

19. A cutting apparatus according to claim 17 wherein the control system is operable to select the frequency of vibration that best suits the cutting of the slab of material.

20. A cutting apparatus according to any one of claims 16 to 19 wherein the control system is operable to select from a plurality of blades including straight and curved blades.

21. A cutting apparatus according to any one of claims 16 to 20 wherein the blade is operable to cut a slab of material at angles other than perpendicular to the surface of the slabs.

22. An article of manufacture including a computer readable medium having instructions stored on the medium that controls a cutting apparatus according to any one of claims 16 to 21.

CLAIMS:

1. A method for cutting a slab of material to effect removal of a part thereof including placing material that forms the slab into a mould and cutting the slab material with a cutting tool vibrating at a preselected frequency when the slab material is in a semi-set state, wherein the cutting tool is a blade that is maneuvered on a path along the slab and cuts the material and the mould such that the material is cut at least to its full depth.

2. A method according to claim 1 wherein the slab material is cementitious and the constituent materials include cement with other materials where the combined mixture has particle sizes sufficiently small to allow the slab material to be cut with the vibrating cutting tool.

3. A method according to claim 2 wherein the cementitious material is poured into a mould and subsequently allowed to cure to a semi-set state being a state that is sufficiently cured to allow the cutting tool to separate the slab without the material deforming either during or subsequent to the operation of the cutting tool.

4. A method according to claim 1 wherein the slab material is non-cementitious and the constituent materials subsequent to mixing are relatively dry, the mixture is pressed into a mould and heated to render the material to a semi-set state prior to cutting the slab.

5. A method according to claim 1 wherein the slab material is gypsum and wherein the gypsum slab material is lined with a cellulous material both of which are cut with the cutting tool whilst the gypsum material is in a semi-set state.

6. A method according to any one of the preceding claims wherein the pre-selected frequency of the vibrating cutting tool is an ultrasonic frequency.

7. A method according to any one of the preceding claims wherein the frequency of vibration may be selected to best suit the constituent material of the slab.

8. A method according to any one of claims 1 to 7 wherein the cutting tool is a curved blade.

9. A method according to any one of the preceding claims wherein the cutting tool is maneuvered under the direction of a control system including a micro-processor and a memory for storing instructions such that the position and movement of the cutting tool is determined by the stored instructions executed by the micro-processor.

10. A method according to any one of the preceding claims wherein the slab material in a semi-set state is disposed substantially horizontally and the cutting tool is a straight blade that is maneuvered under the direction of a control system such that the vibrating blade passes through the slab material cutting same at desired locations.

11. A method according to either claim 9 or claim 10 wherein the blade is disposed at an angle other than perpendicular to the surface of the slab of material thus allowing portions of the slab to be separated with an angled cut.

12. A method according to any one of the preceding claims wherein a plurality of cutting tools are used when cutting a slab of material, the most appropriate cutting tool being selected according to the cutting requirement for a particular region of the slab of material.

13. A method according to any one of the preceding claims wherein cutting the slab of material includes removing a fine layer of material from any one or more of the surfaces of the slab of material.

14. A method according to any one of claims 1 to 3 or claims 6 to 13 wherein the slab material is cementitious and the mould is formed from a substrate with a malleable material applied thereto thus forming mould walls to retain poured slab material within the mould, said malleable material capable of separation by the vibrating cutting tool during the cutting of the slab material in a semi-set state.

15. A slab product separated from a slab of material according to a method claimed in any one of the preceding claims.

16. A cutting apparatus when used to cut a slab of material in a semi-set state produced by the method of any one of claims 1 to 14, the cutting apparatus including a vibrating blade, a micro-processor and a memory that stores instructions operably connected thereto, the location of the blade being determined by the stored instructions, said micro-processor executing the stored instructions thus directing the control system to maneuver the vibrating cutting blade on a path along the slab of material to effect removal of a part of the slab material.

17. A cutting apparatus according to claim 16 wherein the control system selects the frequency of vibration of the blade.

18. A cutting apparatus according to claim 17 wherein the control system selects an ultrasonic frequency for vibration of the blade.

19. A cutting apparatus according to claim 17 wherein the control system is operable to select the frequency of vibration that best suits the cutting of the slab of material.

20. A cutting apparatus according to any one of claims 16 to 19 wherein the control system is operable to select from a plurality of blades including straight and curved blades.

21. A cutting apparatus according to any one of claims 16 to 20 wherein the blade is operable to cut a slab of material at angles other than perpendicular to the surface of the slabs.

22. An article of manufacture including a computer readable medium having instructions stored on the medium that controls a cutting apparatus according to any one of claims 16 to 21.