WHAT IS CLAIMED IS:

1. A machining system comprising:

a machining unit configured to machine an upper edge and a lower edge of a plate-like work held in a horizontal orientation; and

a moving apparatus configured to move the machining unit,

the machining unit comprising

a rotating tool configured to rotate about an axis in a vertical direction and machine the work,

an upper surface abutting member configured to be abutted against an upper surface of the work when machining the work by the rotating tool,

an end face abutting member configured to be abutted against an end face of the work between the upper edge and the lower edge when machining the work by the rotating tool, and

a vertical moving means configured to change a position of the upper surface abutting member in the vertical direction with respect to the rotating tool, and

the rotating tool comprising

a machining portion main body,

a first machining portion provided on a lower side of the machining portion main body and configured to machine the upper edge of the work, and

a second machining portion provided on an upper side of the machining portion main body and configured to machine the lower edge of the work,

wherein the upper surface abutting member is a member including an insertion portion into which the rotating tool is inserted,

the insertion portion is a hole,

the upper surface abutting member includes an abutting portion surrounding the hole and abutted against the upper surface of the work, and

the abutting portion projects downward from a lower surface of the upper surface abutting member and is annular so as to surround the insertion portion.

2. A machining system comprising:

a machining unit configured to machine an upper edge and a lower edge of a plate-like work held in a horizontal orientation; and

a moving apparatus configured to move the machining unit,

the machining unit comprising

a rotating tool configured to rotate about an axis in a vertical direction and machine the work,

an upper surface abutting member configured to be abutted against an upper surface of the work when machining the work by the rotating tool,

an end face abutting member configured to be abutted against an end face of the work between the upper edge and the lower edge when machining the work by the rotating tool, and

a vertical moving means configured to change a position of the upper surface abutting member in the vertical direction with respect to the rotating tool, and

the rotating tool comprising

a machining portion main body,

a first machining portion provided on a lower side of the machining portion main body and configured to machine the upper edge of the work, and

a second machining portion provided on an upper side of the machining portion main body and configured to machine the lower edge of the work,

wherein the upper surface abutting member is a member including an insertion portion into which the rotating tool is inserted,

the upper surface abutting member comprises at least two planer members each having a flat lower surface abutted against the upper surface of the work, and

the insertion portion comprises a gap between the planer members.

3. The system according to claim 1 or 2, wherein the end face abutting member comprises

a first end face abutting member supported by the machining portion main body on an upper side of the second machining portion, and

a second end face abutting member supported by the machining portion main body on a lower side of the first machining portion.

4. The system according to claim 1 or 2, further comprising:

a sensor configured to measure a plate thickness of the work; and

a control means configured to control a position of the upper surface abutting member with respect to the rotating tool by vertically moving the vertical moving means based on a measurement result of the sensor.

5. The system according to claim 1 or 2, wherein

the vertical moving means includes a plurality of column members configured to support the upper surface abutting member,

the plurality of column members are arranged at an equal angular pitch in a circumferential direction around the rotating tool.

6. A machining method of machining a plate-like work held in a horizontal orientation by moving a machining unit while abutting the machining unit against an upper edge and a lower edge of the work,

the machining unit comprising

a rotating tool configured to rotate about an axis in a vertical direction and machine the work,

an upper surface abutting member configured to be abutted against an upper surface of the work when machining the work by the rotating tool,

an end face abutting member configured to be abutted against an end face of the work between the upper edge and the lower edge when machining the work by the rotating tool, and

a vertical moving means configured to change a position of the upper surface abutting member in the vertical direction with respect to the rotating tool, and

the rotating tool comprising

a machining portion main body,

a first machining portion provided on a lower side of the machining portion main body and configured to machine the upper edge of the work, and

a second machining portion provided on an upper side of the machining portion main body and configured to machine the lower edge of the work,

wherein the upper surface abutting member is a member including an insertion portion into which the rotating tool is inserted,

the insertion portion is a hole,

the upper surface abutting member includes an abutting portion surrounding the hole and abutted against the upper surface of the work, and

the abutting portion projects downward from a lower surface of the upper surface abutting member and is annular so as to surround the insertion portion,

the method comprising:

machining the upper edge by the first machining portion while abutting the upper surface abutting member against the upper surface of the work;

changing a relative position in the vertical direction between the abutting portion of the upper surface abutting member and the second machining portion of the rotating tool by driving the vertical moving means; and

machining the lower edge by the second machining portion while keeping the abutting portion of the upper surface abutting member abutted against the upper surface of the work.

7. A machining method of machining a plate-like work held in a horizontal orientation by moving a machining unit while abutting the machining unit against an upper edge and a lower edge of the work,

the machining unit comprising

a rotating tool configured to rotate about an axis in a vertical direction and machine the work,

an upper surface abutting member configured to be abutted against an upper surface of the work when machining the work by the rotating tool,

an end face abutting member configured to be abutted against an end face of the work between the upper edge and the lower edge when machining the work by the rotating tool, and

a vertical moving means configured to change a position of the upper surface abutting member in the vertical direction with respect to the rotating tool, and

the rotating tool comprising

a machining portion main body,

a first machining portion provided on a lower side of the machining portion main body and configured to machine the upper edge of the work, and

a second machining portion provided on an upper side of the machining portion main body and configured to machine the lower edge of the work,

wherein the upper surface abutting member is a member including an insertion portion into which the rotating tool is inserted,

the upper surface abutting member comprises at least two planer members each having a flat lower surface abutted against the upper surface of the work, and

the insertion portion comprises a gap between the planer member,

the method comprising:

machining the upper edge by the first machining portion while abutting the upper surface abutting member against the upper surface of the work;

changing a relative position in the vertical direction between the upper surface abutting member and the second machining portion of the rotating tool by driving the vertical moving means; and

machining the lower edge by the second machining portion while keeping the upper surface abutting member abutted against the upper surface of the work.