WHAT IS CLAIMED IS:

1. A laser machining apparatus for machining a workpiece by irradiating a laser beam, the laser machining apparatus comprising:

holding means for holding the workpiece;

laser irradiation means for irradiating a laser beam onto the workpiece held by the holding means;

machining feed means for relatively moving the holding means and the laser irradiation means in a machining feed direction;

indexing feed means for relatively moving the holding means and the laser irradiation means in an indexing feed direction; and

control means configured to control the operation of each component, wherein the control means performs,

a machining step of irradiating a laser beam from the laser irradiation means while at the same time moving the laser irradiation means relative to the holding means in a first direction parallel to the machining feed direction at a given speed so as to machine the workpiece, held by the holding means, along an arbitrary scheduled division line up to an end portion of the workpiece,

a stopping step of stopping, after the machining step, the laser irradiation means relative to the holding means,

an indexing step of relatively moving the holding means and the laser irradiation means in the indexing feed direction so as to set the irradiation position of the laser beam at an extension of a scheduled division line to be machined next, and

a starting step of accelerating, after the stopping step, the laser irradiation means relative to the holding means in a second direction opposite to the first

direction so as to bring the laser irradiation means to the given speed before the laser beam reaches the end portion of the workpiece, and

wherein the control means is configured to perform the stopping and indexing steps simultaneously for a first time period after the machining step, perform the indexing step without the stopping step for a second time period after the first time period, and cause the starting step to be performed simultaneously with the indexing step for a third time period after the second time period until a start of the machining step at a next scheduled division line.

2. A laser machining apparatus for machining a workpiece by irradiating a laser beam, the laser machining apparatus comprising:

holding means for holding the workpiece;

laser irradiation means for irradiating a laser beam onto the workpiece held by the holding means;

machining feed means for relatively moving the holding means and the laser irradiation means in a machining feed direction;

indexing feed means for relatively moving the holding means and the laser irradiation means in an indexing feed direction; and

control means configured to control the operation of each component, wherein the control means performs,

a machining step of irradiating a laser beam from the laser irradiation means while at the same time moving the laser irradiation means relative to the holding means in a first direction parallel to the machining feed direction at a given speed so as to machine the workpiece, held by the holding means, along an arbitrary scheduled division line up to an end portion of the workpiece,

a stopping step of stopping, after the machining step, the laser irradiation means relative to the holding means,

an indexing step of relatively moving the holding means and the laser irradiation means in the indexing feed direction so as to set the irradiation position of the laser beam at an extension of a scheduled division line to be machined next, and

a starting step of accelerating, after the stopping step, the laser irradiation means relative to the holding means in a second direction opposite to the first direction so as to bring the laser irradiation means to the given speed before the laser beam reaches the end portion of the workpiece, and

wherein the control means is configured to perform the stopping and indexing steps simultaneously for a first time period after the machining step, perform the starting step simultaneously with the indexing step for a second time period after the first time period, and perform the starting step without the indexing step for a third time period after the second time period until a start of the machining step at a next scheduled division line.