

Claims

1. A method for machining a workpiece (1) by a grinding machine comprising: a spindle (3) arranged for rotating the workpiece (1) around and translated along a first axis (4), a first abrasive wheel (6) arranged to rotate around a second axis (61) and to translate along a third axis (62) oblique or perpendicular to the second axis (61), such as to machine a peripheral portion of the workpiece (1), and a guiding support (5) spaced distally from said spindle along the first axis (4) and arranged for slidably supporting an end of the workpiece (1); the method comprising the step of:

rotating the workpiece (1) around the first axis (4) and translating the workpiece (1) along the first axis (4) toward the guiding support so as to distally extend a peripheral portion (103) of the workpiece (1); and simultaneously

rotating the first abrasive wheel (6) around the second axis (61) and translating the first abrasive wheel (6) along the third axis (62) such that the first abrasive wheel (6) machines said peripheral portion (103) of the workpiece (1);

wherein the first abrasive wheel (6) is translated along the third axis (62); and

wherein a position in translation of the first abrasive wheel (6) along the third axis (62) is determined as a function of

a position of the workpiece (1) along the first axis (4), and an angular position of the workpiece (1) around the first axis.

2. The method according to the previous claim, wherein the grinding machine further comprises a second abrasive wheel (7) arranged to rotate around a fourth axis (71) and to translate along a fifth axis (72) oblique or perpendicular to the fourth axis (71), such as to machine a peripheral portion of the workpiece (1); the method further comprising the step of:

rotating the second abrasive wheel (7) around the fourth axis (71) and translating the second abrasive wheel (7) along the fifth axis (72) such that the second abrasive wheel (7) machines a peripheral portion of the workpiece (1) extending distally from said second abrasive wheel (7);

wherein the second abrasive wheel (7) is translated along the fifth axis (72); and

wherein a position in translation of the second abrasive wheel (7) along the fifth axis (72) is determined as a function of

- 5 a position of the workpiece (1) along the first axis (4), and
 an angular position of the workpiece (1) around the first axis (4).

3. The method according to the previous claim, wherein said first abrasive wheel (6) and said second abrasive wheel (7) are arranged to machine substantially the same peripheral portion (103) of the workpiece (1).

- 10 4. The method according to any claim 2 or 3, wherein the position of the workpiece used for determine the position in translation of the first abrasive wheel (6) along the third axis (62) is the same as the position of the workpiece (1) used for determine the position in translation of the second abrasive wheel (7) along the fifth axis (72).

- 15 5. The method according to any one of claims 2 to 4, wherein the angular position of the workpiece (1) used for determine the position in translation of the first abrasive wheel (6) along the third axis (62) is the same as the angular position of the workpiece used for determine the position in translation of the second abrasive wheel (7) along the fifth axis (72).

- 20 6. The method according to any one of claims 2 to 5, wherein said first abrasive wheel (6) and said second abrasive wheel (7) are arranged such that the third (62) and the fifth axis (72) are substantial coaxial.

7. The method according to any one of claims 2 to 6, wherein said first abrasive wheel (6) and said second abrasive wheel (7) are arranged such that the
25 second (61) and the fourth axis (62) are substantial parallel with respect to the first axis (4).

8. The method according to any one of the previous claim, wherein the workpiece (1) is translated along the first axis (4) toward the guiding support (5) until

that the entire portion of the workpiece to be machined extends distally from the guiding support (5).

9. The method according to any one of the previous claims, wherein the workpiece (1) is translated along the first axis (4) only toward the first and/or second
5 abrasive wheel (6, 7).

10. The method according to the previous claim, wherein the workpiece (1) is continuously translated along the first axis (4).

11. The method according to the previous claim, wherein the workpiece (1) is translated along the first axis (4) toward the first and/or second abrasive wheel (6, 7)
10 at a predefined translation speed.

12. The method according to claim 10, wherein the workpiece (1) is translated along the first axis (4) at a variable translation speed.

13. The method according to any one of claims 11 to 12, wherein the position in translation of the first abrasive wheel (6) and/or the position of the second
15 abrasive wheel (7) is further determined as a function of said predefined or variable translation speed.

14. The method according to claim 12, wherein a determination of a position in translation of the first abrasive wheel (6) and/or of the second abrasive wheel (7) comprises a step of selecting a translation speed of the workpiece (1).

20 15. The method according to any one of the previous claims, wherein the workpiece (1) is rotated along the first axis (4) at a predefined rotational speed.

16. The method according to any one of claims 1 to 14, wherein the workpiece (1) is rotated along the first axis (4) at a variable rotational speed.

17. The method according to any one of claims 15 to 16, wherein the
25 position in translation of the first abrasive wheel (6) and/or the position of the second

abrasive wheel (7) is further determined as a function of said predefined or variable rotational speed.

18. The method according to claim 16, wherein a determination of a position in translation of the first abrasive wheel (6) and/or of the second abrasive wheel (7) comprises a step of selecting a rotational speed of the workpiece (1).

19. The method according to any one of the previous claims, wherein the third (62) and/or the fifth axis (72) are substantially perpendicular with respect to the first axis (4).

20. The method according to any one of the previous claims, wherein the first abrasive wheel (6) is translated in successive positions in translation along the third axis (62) and/or the second abrasive wheel (7) is translated in successive positions in translation along the fifth axis (72); wherein each position of the first abrasive wheel (6) and/or second abrasive wheel (7) is determined as a function of a position of the workpiece (1) along the first axis (4), and an angular position of the workpiece (1) around the first axis (4).

21. A grinding machine for carrying out a method for machining a workpiece according to any one of the previous claims.