Claims

1. A method for measuring the thickness of flat workpieces (18) processed in a double-sided processing machine, comprising the following steps:
   - the workpieces are processed in a working gap (16) formed between an upper working disk (10) and a lower working disk (12) of the double-sided processing machine, involving rotating the working disks (10, 12) relative to one another in such a way that material is removed,
   - the workpiece thickness is optically measured during the processing of the workpieces (18) by means of at least one optical thickness measurement apparatus arranged on the upper working disk (10) and/or the lower working disk (12), wherein the at least one thickness measurement apparatus measures the workpiece thickness of the workpieces (18) located in the working gap (16) through at least one through-hole (20) in the upper working disk (10) and/or the lower working disk (12),
   - the measurement results of the at least one thickness measurement apparatus are supplied to a control apparatus (42) of the double-sided processing machine,
   - once a previously specified target thickness of the workpieces (18) is reached, the control apparatus (42) terminates the processing operation of the workpieces,
   - characterized in that at least one focusing optic (22) of the at least one thickness measurement apparatus is arranged in the at least one through-hole (20).

2. The method according to Claim 1, characterized in that the at least one thickness measurement apparatus measures the thickness of the workpieces (18) by means of an interferometric thickness measurement method.

3. The method according to any one of the preceding claims, characterized in that

an optical radiation source of the at least one thickness measurement apparatus emits infrared radiation.

4. The method according to Claim 3, characterized in that the focusing optic (22) has a focus depth of at least 1 mm, preferably at least 2 mm.

5. The method according to any one of the preceding claims, characterized in that the at least one through-hole (20) is flushed with compressed air in the region of its entry to the working gap (16).

6. The method according to any one of the preceding claims, characterized in that an excess pressure with respect to the working gap (16) is generated in the at least one through-hole (20).

7. The method according to any one of the preceding claims, characterized in that at least one protective window (24) which is at least partially transparent to optical radiation from an optical radiation source of the at least one thickness measurement apparatus is arranged in the at least one through-hole (20) between the thickness measurement apparatus and the working gap (16).

8. The method according to Claim 7, characterized in that the at least one protective window (24) consists of aluminum oxide or calcium fluoride.

9. The method according to any one of Claims 7 or 8, characterized in that the at least one protective window (24) is recessed by a maximum of 10 mm with respect to the surface delimiting the working gap (16) of the working disk provided with the at least one through-hole (20), preferably by a maximum of 3 mm, more preferably by a maximum of 1 mm, most preferably by a maximum of 0.3 mm.

10. The method according to any one of Claims 7 to 9, characterized in that the at least one protective window (24) is cleaned from the side of the working gap (16) by a cleaning apparatus by means of a cleaning fluid.

11. The method according to any one of the preceding claims, characterized in that the workpiece thickness during the processing of the workpieces (18) is optically measured through multiple through-holes (20) configured in the upper working disk (10) and/or the lower working disk (12).

12. The method according to Claim 11, characterized in that the workpiece thickness is measured through the different through-holes (20) simultaneously during the processing.

13. The method according to Claim 11, characterized in that the workpiece thickness is measured through the different through-holes (20) at different times during the processing.

14. The method according to any one of the preceding claims, characterized in that multiple workpieces (18) are processed simultaneously in the double-sided processing machine, wherein the measurement results of the at least one thickness measurement apparatus are in each case clearly allocated to one workpiece (18).

15. The method according to any one of the preceding claims, characterized in that the at least one thickness measurement apparatus is arranged in a vibration-dampened manner on the upper working disk (10) and/or the lower working disk (12).

16. The method according to any one of the preceding claims, characterized in that the control apparatus is arranged at a separate location from the working disks

(10, 12).

17. The method according to Claim 16, characterized in that the data transfer takes place between the at least one thickness measurement apparatus and the control apparatus (42) and the electrical supply of the at least one thickness measurement apparatus via at least one sliding contact.