Patent Claims

1. A device for adjusting printheads (2) relative to one another upon their mounting to a printhead retaining plate (5) common for multiple printheads (2), the printheads (2) each including a nozzle plate (4) having multiple nozzles (3) for printing, and having at least a pair of holes, namely at least one round hole (13) and/or at least one elongated hole (14) in the nozzle plate (4) for manufacturing and/or assembly purposes, and wherein the printhead retaining plate (5) comprises an elongated opening (6) at the site of each printhead (2), which elongated opening (6) corresponds to or is slightly larger than the base area of a nozzle plate (4), in order to provide a free access of the nozzle plate (4) to a substrate to be imprinted, **characterized** by an assembly template (16) common for multiple printheads (2), comprising a top-side contact surface that faces the bottom side (10) of the printhead retaining plate (5) common for multiple printheads (2), wherein for each printhead (2) at least a pair of counterparts is provided, or a pair of counterparts in the form of ~~pin~~ pins (17, 18), that fit exactly into at least one round hole (13) and/or at least one elongated hole (14) in the corresponding nozzle plate (4), so that when the printheads (2) are inserted into the assembly template (16) in such a way that each pair of round hole counterparts and elongated hole counterparts (17, 18) engages with the corresponding round hole and elongated hole (13, 14) in the nozzle plates (4) of all printheads (2), the nozzles (3) of all printheads (2) are aligned with one another in the desired manner, wherein the assembly template (16) is removable from the printhead retaining plate (5), after the printheads (2) are assembled with the printhead retaining plate (5).

2. The device according to claim 1, characterized in that the assembly template (16) is designed for application to the bottom side (10) of the retaining plate (5) for multiple printheads (2).

3. The device according to claim 2, characterized in that the assembly template (16) on its contact surface facing the retaining plate (5) has marked or emphasized or elevated, areas, for centering engagement with the continuous recesses in the retaining plate (5), for accommodating the nozzle plates (4) of multiple printheads (2).

4. The device according to one of the preceding claims, characterized in that the assembly template (16) on its contact surface facing the retaining plate (5), or in the area of the marked or emphasized or elevated areas, has one or more depressions, or one or more elongated depressions, for accommodating one or more rows of nozzles (3) of a printhead (2).

5. The device according to one of the preceding claims, characterized in that the counterparts to at least one round hole (13) and/or to at least one elongated hole (14), or the pins (17, 18), provided on the assembly template (16) are situated on the contact surface of the assembly template (16) facing the retaining plate (5), or the area of the marked or emphasized or elevated areas.

6. The device according to one of the preceding claims, characterized in that the counterparts to at least one round hole (13) and/or to at least one elongated hole (14), or the pins (17, 18), provided on the assembly template (16) are situated on the contact surface of the assembly template (16) facing the retaining plate (5) in the area of oppositely situated ends of one or more elongated depressions for accommodating one or more rows of nozzles (3) of a printhead (2).

7. The device according to one of the preceding claims, characterized in that in each case a pair of counterparts, provided on the assembly template (16), to at least one round hole (13) and/or to at least one elongated hole (14), or the pins (17, 18), on the contact surface of the assembly template (16) facing the retaining plate (5) is in approximate alignment with an elongated depression for accommodating one or more rows of nozzles (3) of a printhead (2).

8. The device according to one of the preceding claims, characterized in that in each case a pair of counterparts, provided on the assembly template (16), to at least one round hole (13) and/or to at least one elongated hole (14), or the pins (17, 18), on the contact surface of the assembly template (16) facing the retaining plate (5) is laterally offset with respect to the longitudinal center axis of the elongated depression in question for accommodating one or more rows of nozzles (3) of a printhead (2), or is laterally offset by one-half the width of the nozzle plate or less.

9. The device according to one of the preceding claims, characterized in that multiple pairs of counterparts, provided on the assembly template (16), to at least one round hole (13) and/or to at least one elongated hole (14), or the pins (17, 18), on which the contact surface of the assembly template (16) facing the retaining plate (5) is provided, are each laterally offset with respect to the longitudinal center axis of the elongated depression, associated with each pair, for accommodating one or more rows of nozzles (3) of a printhead (2), in particular laterally offset in the same direction for all pairs.

10. The device according to one of the preceding claims, characterized in that the assembly template (16) has one or more means, for example clamping elements, for fixing to the retaining plate (5).

11. The device according to one of the preceding claims, characterized in that the assembly template (16) is made from a metal plate, or from a plate made of a noble metal or nonferrous metal or stainless steel, or a corrosion-resistant metal alloy.

12. The device according to one of the preceding claims, characterized in that the counterparts, provided on the assembly template (16), to at least one round hole (13) and/or to at least one elongated hole (14), preferably the pins (17, 18), on the contact surface of the assembly template (16) facing the retaining plate (5) are manufactured in one piece with a plate-shaped base body of the assembly template (16).

13. The device according to one of the preceding claims, characterized in that the elevated counterparts, provided on the assembly template (16), to at least one round hole (13) and/or to at least one elongated hole (14), or the pins (17, 18), is (are) produced or machined on the contact surface of the assembly template (16) facing the retaining plate (5) by milling and/or eroding of a preferably plate-shaped base body of the assembly template (16).

14. The device according to one of the preceding claims, characterized in that at least one elevated counterpart to at least one round hole (13) and/or to at least one elongated hole (14), or at least one pin (17, 18), provided on the assembly template (16) is releasably retained in the assembly template (16).

15. The device according to claim 14, characterized in that at least one pin (17, 18) provided on the assembly template (16) is held in a through hole opening in the assembly template (16) in the form of a transition fit or press fit.

16. The device according to claim 14 or 15, characterized in that at least one pin (17, 18) provided on the assembly template (16) is longer than the thickness of the plate of the assembly template (16), in particular in such a way that the pin (17, 18) protrudes at the front side facing the retaining plate (5), and also at the rear side of the assembly template (16) facing away from the retaining plate (5), and is removable from the plate of the assembly template (16) from the rear.

17. The device according to one of claims 14 to 16, characterized in that at least one pin (17, 18) that is provided on the assembly template (16) has a collar or a continuously circumferential collar, or has a collar or a continuously circumferential collar in the area of the pin (17, 18) that is situated directly behind the rear side of the assembly template (16) facing away from the assembly template (16) when the pin (17, 18) is inserted into the retaining plate (5).

18. The device according to one of claims 14 to 17, characterized in that at least one pin (17, 18) that is provided on the assembly template (16) has a cross-

sectionally beveled or rounded edge on its end-face side that protrudes beyond the front side of the assembly template (16) facing the retaining plate (5).

19. A method for adjusting printheads (2) relative to one another, the printheads each including a nozzle plate (4) having multiple nozzles (3) for printing, and having at least a pair of holes, namely at least one round hole (13) and/or at least one elongated hole (14) in the nozzle plate for manufacturing and/or assembly purposes, **characterized** in that multiple printheads (2) are inserted into an assembly template (16) for multiple printheads (2), wherein for each printhead (2) at least a pair of counterparts is provided, or a pair of counterparts in the form of pins (17, 18), that fit exactly into at least one round hole (13) and/or at least one elongated hole (14) in the corresponding nozzle plate (4) in such a way that each pair of round hole counterparts and/or elongated hole counterparts (17, 18) engages with the corresponding round holes and elongated hole (13, 14) in the nozzle plate (4), so that the nozzles (3) of all printheads (2) are aligned with one another in the desired manner, and the printheads (2) that are adjusted relative to one another in this way are then screwed onto a printhead retaining plate (5) or affixed in some other way before the assembly template (16) is removed.

20. The method according to claim 19, characterized in that the assembly template (16) is placed beneath the printhead retaining plate (5) before the printheads (2) are inserted into the assembly template (16).

21. The method according to claim 19 or 20, characterized in that the assembly template (16) is fixed to the bottom side of the printhead retaining plate (5) before the printheads (2) are inserted into the assembly template (16).

22. The method according to one of claims 19 to 21, characterized in that the printheads (2) are inserted into the assembly template (16) through recesses in the printhead retaining plate (5).

23. The method according to one of claims 19 to 22, characterized in that the printheads (2) inserted into the assembly template (16) are fastened to the printhead retaining plate (5) by screwing, for example, or are screwed into the printhead retaining plate (5) from the top, or are screwed in from the side, next to a continuous recess in the retaining plate (5) for accommodating the nozzle plate (4) of the printhead in question (2).

24. The method according to one of claims 19 to 23, characterized in that the assembly template (16) is not removed from the printhead retaining plate (5) until the printheads (2) have been fastened or screwed to the printhead retaining plate (5).