CLAIMS

1. Medical bone connecting device (1; 2; 3; 4; 5) for connecting two bones or bone parts of a human or animal patient, comprising

a first connecting element (13; 21, 22; 23; 33; 42; 51) made of a fiber-reinforced plastics material, which has a first latching structure (133; 212, 222; 233, 233'; 333; 423; 513) with a plurality of first latching elements (134, 134'; 139, 139'; 213, 213', 223, 223'; 234, 234', 334, 334'; 424; 514, 514'); and

a second connecting element (15; 24; 34; 41; 53) made of a fiber-reinforced plastics material, which has a second latching structure (153; 243; 343; 413; 533) with a plurality of second latching elements (154, 154'; 244, 244'; 344, 344'; 414; 534, 534');

wherein the first latching elements (134, 134'; 139, 139'; 213, 213', 223, 223'; 234, 234', 334, 334'; 424; 514, 514') of the first latching structure (133; 212, 222; 233, 233'; 333; 423; 513) are latchable with the second latching elements (154, 154'; 244, 244'; 344, 344'; 414; 534, 534') of the second latching structure (153; 243; 343; 413; 533) in order to fix the first connecting element (13; 21, 22; 23; 33; 42; 51) and the second connecting element (15; 24; 34; 41; 53) to one another and thereby connect the two bones or bone parts to one another.

2. Bone connecting device (1; 2; 3; 4; 5) according to Claim 1, wherein the first latching elements (134, 134'; 139, 139'; 213, 213', 223, 223'; 234, 234', 334, 334'; 424; 514, 514') and the second latching elements (154, 154'; 244, 244'; 344, 344'; 414; 534, 534') are each undercut in such a way that a release of the fixation between the first connecting element (13; 21, 22; 23; 33; 42; 51) and the second connecting element (15; 24; 34; 41; 53) is prevented when the first latching structure (133; 213, 213', 223, 223'; 233, 233'; 333; 423; 513) and the second latching structure (154, 154'; 244, 244'; 344, 344'; 414; 534, 534') are latched together.

3. Bone connecting device (1; 2; 3; 4; 5) according to Claim 1 or 2, wherein the first latching elements (134, 134'; 139, 139'; 213, 213', 223, 223'; 234, 234', 334, 334'; 424; 514, 514') and/or the second latching elements (154, 154'; 244, 244'; 344, 344'; 414; 534, 534') each have a sloping surface inclined to a latching direction (R) in order to facilitate latching of the first latching structure (133; 212, 222; 233, 233'; 333; 423; 513) with the second latching structure (154, 154'; 244, 244'; 344, 344'; 414; 534, 534').

4. Bone connecting device (1; 2; 3; 4; 5) according to one of the preceding claims, wherein the first latching structure (133; 212, 222, 233, 233'; 333; 423; 513) is an inner latching structure of which the first latching elements (134, 134'; 139, 139'; 213, 213', 223, 223'; 234, 234', 334, 334'; 424; 514, 514') face outwards in at least two opposite directions, and wherein the second latching structure (154, 154'; 244, 244'; 344, 344'; 414; 534, 534') is an outer latching structure of which the second latching elements (154, 154'; 244, 244'; 344, 344'; 414; 534, 534') face inwards in at least two opposite directions.

5. Bone connecting device (1; 2; 3; 4; 5) according to Claim 4, wherein the bone connecting device (1; 2; 3; 4; 5) comprises a third connecting element (11; 21, 22; 31, 32), and wherein the second connecting element is a latching clip (15; 24; 34) which serves to clamp the third connecting element (11; 21, 22; 31, 32) between the first connecting element (13; 23; 33) and the second connecting element (15; 24; 34).

6. Bone connecting device (1; 2; 3; 4; 5) according to Claim 5, wherein the latching clip (15; 24; 34) comprises a clamping teeth (155; 245; 345, 345') which is arranged within the second latching elements (154, 154'; 244, 244'; 344, 344').

7. Bone connecting device (1; 2; 3; 4; 5) according to Claim 5 or 6, wherein the latching clip (15; 24; 34), for adjusting its flexibility, has a local recess (157) in a region between the inwardly facing second latching elements (154, 154'; 244, 244'; 344, 344').

8. Bone connecting device (1; 2; 3; 4; 5) according to one of Claims 5 to 7, wherein the third connecting element is a connecting rod (11) and the first connecting element is a tulip head (13) which serves to fix the connecting rod (11) to a threaded shaft (123) of a screw (12), in particular a pedicle screw.

9. Bone connecting device (1; 2; 3; 4; 5) according to one of Claims 5 to 7, wherein the third connecting element is a connecting rod (21, 22; 31, 32) and the first connecting element

is a connector, in particular an axial connector (23) or a parallel connector (33), for connecting two connecting rods (21, 22; 31, 32).

10. Bone connecting device (1; 2; 3; 4; 5) according to Claim 9, wherein the connector (23; 33) has at least one opening (232, 232'; 332, 332') for receiving the connecting rod (21, 22; 31, 32), which at least one opening (232, 232'; 332, 332') widens along a latching direction (R) towards the second connecting element.

11. Bone connecting device (1; 2; 3; 4; 5) according to Claim 4, wherein the first connecting element is a screw (42) and the second connecting element is a bone plate (41), and wherein the screw (42) has an at least partially elastically deformable screw head (421), on which the first latching structure (423) is formed, and the first latching elements (424) and/or the second latching elements (414) preferably form a thread.

12. Bone connecting device (1; 2; 3; 4; 5) according to one of Claims 1 to 4, which is designed as a vertebral body replacement (5), wherein the first connecting element is an expansion slide (51) and the second connecting element is an expansion body (53).

13. Bone connecting device according to one of the preceding claims, wherein the first connecting element (13) and the second connecting element (15) comprise interengaging guides (138, 138', 158, 158'), which preferably together form a dovetail joint to guide the first latching structure (133) relative to the second latching structure (153) during fixation.

14. Bone connecting device according to any one of the preceding claims, wherein the second connecting element comprises a latching clip forming the second latching structure, and wherein the latching clip is connected to the remaining second connecting element via a flexible element.

15. Bone connecting device according to one of the preceding claims, wherein the second connecting element comprises a latching clip, and wherein the first connecting element and

the second connecting element are displaceable relative to each other along the longitudinal direction of the first and second latching elements over preferably a limited range when latched together.