CLAIMS

1. A method for replacing a roller cutter ~~(1)~~ mounted with preload within a housing ~~(2)~~ built into the cutting head of a tunnel boring machine, ~~characterized in that it is~~ the method being implemented with a roller cutter ~~(1)~~ bearing, permanently attached thereto, a member ~~(4)~~ for locking it within the housing ~~(2)~~ and means ~~(5)~~ for applying said preload, and ~~in that it includes~~ including the steps consisting of:

a) removal of a used roller cutter ~~(1)~~ from said housing ~~(2)~~, comprising the following steps:

- clamping, onto the housing ~~(2)~~, of a handling device ~~(3)~~ designed for grasping and guiding the roller cutter ~~(1)~~,
- grasping of the roller cutter by the handling device ~~(3)~~,
- release of the preload applied to the roller cutter ~~(1)~~,
- unlocking of the roller cutter ~~(1)~~ from the housing ~~(2)~~,
- extraction of the roller cutter ~~(1)~~ from the housing ~~(2)~~,
- unclamping the handling device ~~(3)~~ from the housing ~~(2)~~,

b) installation in said housing ~~(2)~~ of a replacement roller cutter ~~(1)~~, comprising the following steps:

- grasping of the roller cutter ~~(1)~~ by the handling device ~~(3)~~,
- docking, then clamping of the roller cutter handling device ~~(3)~~ on the housing ~~(2)~~,
- insertion of the roller cutter ~~(1)~~ into the

housing ~~(2)~~, said roller cutter being guided by the handling device ~~(3)~~,

- locking the roller cutter ~~(1)~~ into the housing ~~(2)~~,
- applying a preload to the roller cutter ~~(1)~~.

2. A method according to Claim 1, ~~characterized in that~~wherein the roller cutter ~~(1)~~ is held by the handling device ~~(3)~~ by its locking member ~~(4)~~.

3. A method according to one of Claims 1 or 2, ~~characterized in that~~wherein it is implemented by means of a mechanized roller cutter handling device ~~(3)~~.

4. A roller cutter suited for the implementation of the replacement process according to one of Claims 1 through 3.

5. A roller cutter according to Claim 4, ~~characterized in that~~wherein said locking member ~~(4)~~ is designed to be immobilized, so that the roller cutter ~~(1)~~ constitutes a rigid block.

6. A roller cutter according to one of Claims 4 or 5, ~~characterized in that~~wherein the locking member includes a bayonet ~~(4)~~ movable in rotation between a position for inserting the roller cutter ~~(1)~~ into the housing ~~(2)~~ and a position for locking the roller cutter ~~(1)~~ into the housing ~~(2)~~.

7. A roller cutter according to one of Claims 4 through 6, ~~characterized in that~~wherein the preloading means include screws ~~(5)~~.

8. A roller cutter according to Claims 6 and 7

combined, ~~characterized in that said screws (5) for preloading the roller cutter (1) are carried by~~wherein the bayonet ~~(4)~~ comprises said screws for preloading the roller cutter in a manner that precludes loss therefrom.

9. A device ~~(3)~~ for handling the roller cutter ~~(1)~~ in the implementation of the roller cutter replacement method according to one of 1 through 3, ~~characterized in that~~wherein it comprises:

- an element ~~(33)~~ for clamping onto the housing,
- an element ~~(34)~~ for grasping the roller cutter,
- means ~~(32)~~ for releasing or applying preload to the roller cutter,
- an element ~~(35)~~ for extracting the roller cutter,
- a member ~~(36)~~ for actuating the locking member ~~(4)~~ of the roller cutter.

10. A device according to Claim 9, ~~characterized in that~~wherein it includes means for cleaning the housing.

11. A device according to one of Claims 8 through 10, ~~characterized in that~~wherein it includes means ~~(41)~~ of transporting, docking and/or clamping onto the housing by a robot.

12. A tunnel boring machine including a cutting head and a plurality of roller cutters ~~(1)~~ according to one of claims 4 through 8 in housings ~~(2)~~ built into the cutting head, said housings ~~(2)~~ bearing contact surfaces ~~(21)~~ for locking the roller cutters ~~(1)~~.

13. A tunnel boring machine according to Claim 12, ~~characterized in that~~wherein the housings ~~(2)~~ have contact surfaces for docking and guiding a roller cutter

handling device ~~(3)~~ according to one of Claims 9 through 11.

14. A tunnel boring machine according to one of Claims 12 or 13, ~~characterized in that~~wherein the roller cutters ~~(1)~~ and the housings ~~(2)~~ have respective complementary support contact surfaces ~~(10, 20)~~ for centering and guiding the roller cutter in the housing.