With the pliers as described according to the invention an assembly having a great mechanical simplification over the pliers which for the same purpose have been used so far, with consequent cost savings. With the variable geometry cross-section configuration of the tendons of the driving means of the pliers for each change of orientation of said section it is possible, according to the invention, to dispense with the use of idler pulleys or gears for transverse rotation of parts where the tendons run. The configuration of the invention further allows a very robust assembly to be obtained with a large durability of the cables as well as the drums around which they are to be rolled up.

According to an aspect of the invention, there is provided minimally invasive laparoscopic surgical pliers comprising jaw means mounted on a rotating body, first means for transmitting movement of the jaw means and second means for transmitting movement of the rotating body, said first and second transmission means respectively comprising at least one tendon each formed by several cables that are arranged such that the cross-section of at least one tendon associated with the first means for transmitting movement has a variable geometry along its path through the interior of a main body; wherein it further comprises modules for changing orientation of the cables of the tendon, each module having an elongated channel shaped to guide said the cables of the corresponding tendon causing a rotation on its orientation; and wherein the cross-sectional geometry of each tendon has a first arrangement in which the respective cables are arranged, in cross-section, with their longitudinal axes in a radial arrangement, a second arrangement in which the respective cables of each tendon are arranged, in cross-section, with their longitudinal axes in a distribution in a first orientation, and a third arrangement in which the respective cables of each tendon are arranged, in cross section, with their longitudinal axes in a second orientation, different from the first orientation.

Other objects, advantages and features of the minimally invasive laparoscopic surgical pliers of this invention will become apparent from the description of a preferred embodiment of the invention. This description is given only by way of an example and it is shown in the accompanying drawings.

Brief Description of Drawings

In said drawings,

Figure 1 is a perspective part view of the main body of the minimally invasive laparoscopic surgical pliers of the present invention;

Figure 2 is a perspective view of one embodiment of one module for changing the orientation in the tendon of pliers;

Figure 3 is a perspective part view of the minimally invasive laparoscopic surgical pliers of the present invention, with jaw means and rotating body mounted at the distal end in the main body of the assembly;

Figure 4 is a perspective part view of the pliers of the present invention in which the configuration of the tendons and the change of orientation thereof are diagrammatically shown.

Detailed description of a preferred embodiment

In the Figures 1-4 enclosed herein a preferred embodiment of minimally