Title: Training system comprising a cycling device

The invention relates to a training system (also referred to as training device) for training a body part of a user. Said training system comprises a frame for in use positioning the training system on a surface and a cycling device (also referred to as cycling means) comprising at least one cycling member which is configured to rotate around a cycle axis.

To train the body part, the user makes a cycling movement by rotating the cycling member around the cycle axis with the use of said body part. The cycling member may comprise a pedal. The user may rotate the pedal with his/her legs. It will be clear that the training system may have any other type of cycling device, such as cycling device configured to rotate the at least one cycling member with a part of the body of the user different that his/her legs. For example, the cycling member may be rotated around the cycling axis with an arm of the user.

A disadvantage of the training system known from the prior art is that the user must train a relatively long time period to achieve an effective training.

An object of the invention is to provide an improved training system.

The training system according the invention comprises a vibration device (also referred to as vibration means) for moving the at least one cycling member in a vibrating manner.

In an embodiment of the training system according to the invention, the vibration device is configured to move the cycle axis in a vibrating manner. The training system may be configured such that in use the cycle axis moves relative to the frame in a vibrating manner. The cycling device may be connected to the frame such that the cycle axis is movable relative to the frame in a vibrating manner.

In an embodiment of the training system according to the invention, the vibration device comprises a crankshaft which is connected to the cycle axis and configured to move the cycle axis in a vibrating manner. The crankshaft may comprise a crankshaft axis, the cycle axis may be located at a distance from the crankshaft axis, and the crankshaft may be configured to rotate the cycle axis around the crankshaft axis. The crankshaft may be connected to the frame such that the crankshaft axis is located in a substantially fixed position relative to the frame. The crankshaft may comprise a first eccentric weight for compensating the forces induced by the vibrating movement of the cycle axis.

The cycling device may comprise a cycle disc configured to rotate around the cycle axis when the at least one cycle member is rotated around said cycle axis. The cycle disc may engage to an endless body. The vibration device may be configured the move the cycle disc in a vibrating manner. The crankshaft may comprise a second eccentric weight for compensating the forces induced by the vibrating movement of the cycle disc.

In an embodiment of the training system according to the invention, the cycle axis is coupled to the cycle disc via a damping coupling to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc. The damping coupling may comprise elastic material to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc. The damping coupling may comprise an elastic bushing to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc, which elastic bushing surrounds the cycle axis. The damping coupling may comprise a rubber bushing to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc, which rubber bushing surrounds the cycle axis.

The training system may comprise a tensioning device for tensioning the endless body engaged by the cycle disc. The tensioning device may engage the endless body and may be connected to the crankshaft such that the tensioning device in use moves in opposite phase when compared to the vibrating movement of the cycle axis. The tensioning device may comprise at least one tensioning roller engaging the endless body and a roller support, which roller support connects said at least one tensioning roller to the crankshaft and in use moves in opposite phase when compared to the vibrating movement of the cycle axis.

In an embodiment of the training system according the invention, the cycle disc engages the endless body at a first engaging region and a second engaging region and a tensioning guide engages the endless body between the first engaging region and the second engaging region. The first engaging region and the second engaging region may be located at a distance from each other.

The training system may comprise a driving device (also referred to as driving means) for driving the vibration device. The driving device may be configured to be driven by the cycling device. The training system may comprise a coupling device for coupling the driving device to the vibration device and for decoupling the driving device from the vibration device. The coupling device may comprises a coupling control member for controlling the coupling and decoupling between the coupling device and the vibration device.

The frame may comprise a seat member and the cycle axis may be movable relative to the seat member in a vibrating manner.

In an embodiment of the training system according to the invention, the cycling device may be pivotable connected to the frame such that the cycle axis is movable relative to the frame in a vibrating manner.

In a further embodiment of the training system according to the invention, the cycling device is connected to the frame via a pivot member. The pivot member may comprise a longitudinal axis. The pivot member may comprise an elongated body, for example formed out of beam-like parts.

The pivot member may be pivotable connected to the frame at a first connection point on the pivot member. The vibration device may be connected to the pivot member at a second connection point on the pivot member. In the direction of the longitudinal axis the first connection point and the second connection point may be located at a distance from each other.

The cycling device may be connected to the pivot member at a third connection point on the pivot member. In the direction of the longitudinal axis the third connection point may be located at a larger distance from the first connection point than the second connection point is located from said first connection point. In the direction of the longitudinal axis the second connection point may be located at a larger distance from the first connection than the third connection point is located from said first connection point. In the direction of the longitudinal axis the second connection point may be located at the same distance from the first connection point as the third connection point is located from said first connection point.

A damper (also referred to as damping means) may be connected to the pivot member at a fourth connection point on the pivot member. In the direction of the longitudinal axis the third connection point may be located at a larger distance from the first connection point than the fourth connection point is located from said first connection point. In the direction of the longitudinal axis the fourth connection point may be located at a larger distance from the first connection point than the third connection point is located from said first connection point. In the direction of the longitudinal axis the third connection point may be located at the same distance from the first connection point as the fourth connection point is located from said first connection point.

The pivot member may comprise a pivot part extending from a side of the frame. The first connection point may be located on said pivot part. The second connection point may be located on said pivot part. The third connection point may be located on said pivot part. The fourth connection point may be located on said pivot part.

In an embodiment of the training system according to the invention, the vibration device comprises a crankshaft connected to the pivot member. The crankshaft may be connected to the pivot member at the second connecting point. The crankshaft may be connected the pivot member via a connecting rod. It will be clear that the crankshaft may be connected to pivot member via any other type of connecting bar.

The training system may comprise a driving device for driving the crankshaft. Said driving device may comprise an electric motor which is coupled to the crankshaft. The vibration device may be driven by the cycling device. The crankshaft may be driven by the cycling device. Said driving device may comprise a flywheel which is coupled to the crankshaft. The flywheel may be coupled to the crankshaft such that a rotational movement of the flywheel is transmitted to the crankshaft. The flywheel may be coupled to the crankshaft by an endless driving body. Said endless driving body may be any suitable type of endless body, such as a endless belt or endless chain.The flywheel may be coupled to the crankshaft by at least one endless driving body. The flywheel may be coupled to the crankshaft by only one endless driving body. The flywheel may be coupled to the crankshaft via a gearing device (also referred to as gearing means). The gearing device is configured to select different gear ratios. The gearing device may comprise a derailleur gear or hub gear. The flywheel may be driven by the cycling device. The cycling device may be coupled to the flywheel for driving said flywheel. The flywheel may be coupled to the cycling device such that a rotational movement of the at least one cycle member is transmitted to the flywheel. The cycling device may be coupled to the flywheel by an endless cycling body. Said endless cycling body may be any suitable type of endless body, such as an endless belt or endless chain. The cycling device may be coupled to the flywheel by at least one endless cycling body. The cycling device may be coupled to the flywheel by only one endless cycling body. The flywheel may comprise a first coupling member for engaging the endless driving body. The flywheel may comprise a second coupling member for engaging the endless cycling body. The cycling device may be coupled to the flywheel via a gearing device. The cycling device may comprise a third coupling member for engaging the endless cycling body. The cycling device may comprise a cycle disc configured to rotate around the cycle axis when the at least one cycle member is rotated around said cycle axis. The cycle disc may comprise the third coupling member. The vibration device may comprise a fourth coupling member for

engaging the endless cycling body. The crankshaft may comprise the fourth coupling member.

In a further embodiment of the training system according to the invention, the vibration device comprises at least one eccentric weight which is rotatable connected to the pivot member and an electric drive for rotating the at least one eccentric weight such that the pivot member moves is a vibrating manner.

In another embodiment of the training system according to the invention, the vibration device comprises a disc shaped member which is connected to the cycling device such that the disc shaped member is rotatable around said cycle axis. A circumference of the disc shaped member comprises substantially radial extending protrusions. The vibration device further comprises bearing device (also referred to as bearing means) for bearing against said circumference such that the at least one cycling member moves in a vibrating manner when the disc shaped member is rotated around the cycle axis. Said protrusions of the circumference of the disc shaped member may be formed by a curved, polygonal or the like form of said circumference. The central axis of the disc shaped member may extend substantially parallel with the cycle axis. The central axis of the disc shaped member may substantially coincide with the cycle axis.

The bearing device is configured to force a contact member against the circumference of the disc shaped member. The contact member may be pushed against said circumference by a spring. The bearing device may be configured such that the contact member is only displaceable in a direction radial to the cycle axis.

In an embodiment of the training system according to the invention, the cycling device drives an endless body and the vibration device is configured to vibrate the endless body such that the at least one cycling member moves in a vibrating manner. The endless body may be a driving chain, driving belt or the like. The vibration device may be configured to drive an impact member in an oscillating manner against the endless body. The vibration device may be configured to drive an impact member in an oscillating manner against opposite sides of the endless body. The vibration device may comprise a solenoid to drive the impact member in an oscillating manner.

In a further embodiment of the training system according to the invention, the training system comprises an adjustable cycling resistor for providing and adjusting a resistance to the rotation of the cycling member around the cycle axis.

In another embodiment of the training system according to the invention, the cycle axis is fixed to the frame. In said embodiment, the vibrating movement of the at least one cycling member is transferred to the frame.

The invention further relates to a method of training a body part of a user comprising using said body part for rotating the at least one cycle member around a cycle axis of a training system according the invention.

The invention further relates to the use of a training system according to the invention.

The training system, method and use of said training system according the invention will be explained in detail with reference to the accompanying figures, wherein:
Fig. 1 schematically shows a side view in perspective of a first embodiment of the training system according the invention,
Fig. 2 schematically shows an enlarged view of part II of fig. 1,
Fig. 3 schematically shows a side view in perspective of a second embodiment of the training system according the invention,
Fig. 4 schematically shows a side view in perspective of a third embodiment of the training system according the invention,
Fig. 5 schematically shows a side view in perspective of a fourth embodiment of the training system according the invention,
Fig. 6 schematically shows a side view of a fifth embodiment of the training system according the invention,
Fig. 7 schematically shows a side view of a sixth embodiment of the training system according the invention,
Fig. 8 schematically shows a side view of a seventh embodiment of the training system according the invention,
Fig. 9 schematically shows an enlarged view of the part IX of fig. 8.
Corresponding reference numbers in the fig. 1 – 9 relate to corresponding features, and
Fig. 10 schematically shows a side view in perspective of an eighth embodiment of the training system according to the invention,
Fig. 11 schematically shows a side view of the training system of fig. 10 in the direction of arrow XI,
Fig. 12 schematically shows a side view of the training system of fig. 10 in the direction of arrow XII,
Fig. 13 schematically shows a perspective view in cross section along line XIII of the training system of fig. 12,

Fig. 14 schematically shows a perspective view in cross section along line XIV of the training system of fig. 12,

Fig. 15 schematically shows a side view of an alternative embodiment of the cycling device and vibration device of the training system according the invention,

Fig. 16 schematically shows a side view of an alternative embodiment of the cycling device and vibration device of the training system according the invention,

Fig. 17 schematically shows a side view of an alternative embodiment of the cycling device and vibration device of the training system according the invention,

Fig. 18 schematically shows a side view of an alternative embodiment of the cycling device and vibration device of the training system according the invention,

Fig. 19 schematically shows a side view of an alternative embodiment of the cycling device and vibration device of the training system according the invention,

Fig. 20-25 schematically show a ninth embodiment of the training system according to the invention,

Fig. 26-27 schematically show a tenth embodiment of the training system according to the invention,

Fig. 28-29 schematically show an eleventh embodiment of the training system according to the invention,

Fig. 30-32 schematically show a twelfth embodiment of the training system according to the invention,

Fig. 33-34 schematically show a thirteenth embodiment of the training system according to the invention,

Fig. 35-36 schematically show a fourteenth embodiment of the training system according to the invention,

Fig. 37 schematically show a fifteenth embodiment of the training system according to the invention, and

Fig. 38-40 schematically show a sixteenth embodiment of the training system according to the invention,

In the figures 1-40, corresponding features are indicated by corresponding reference numbers.

Figure 1 shows a training system 1 for training a body part of a user. Said training system 1 comprises a frame 2 for in use positioning the training system 1 on a surface 3 and a cycling device 4 comprising two cycling members 5. The cycling members 5 are configured to rotate around a cycle axis 6. A vibration device 7 is provided for the moving of the cycling members 5 in a vibrating manner.

The cycling members 5 are pedals and in use the feet of a user are positioned on said pedals. To train the lower part of the body of the user, he/she makes a cycling movement with his/her legs and feet by rotating the cycling members 5 around the cycle axis 6. During said cycling movement, the vibrating movement of the cycling member is transferred to the lower part of the body of the user. The vibrating movement of the cycling member 5 is in addition to the rotational movement around the cycle axis 6 of said cycling member 6. Due to this, a more effective training is reached. The same training effect is reached in a shorter time period when compared to the training system known from the prior art.

The frame 2 of the training system 1 comprises a seat member 8 and a user support 34. A pivot member 9 is pivotable connected to the frame 2 at a first connection point 11 on said pivot member 9. The vibration device 7 is connected to the pivot member 9 at a second connection point 12 on said pivot member 9. The pivot member 9 comprises a longitudinal axis 10. In the direction of said longitudinal axis 10, the first connection point 11 and the second connection point 12 are located at a distance from each other.

The cycling device 4 is connected to the pivot member 9 at a third connection point 13 on the pivot member 9. In the direction of the longitudinal axis 10, the third connection point 13 is located at a larger distance from the first connection point 11 than the second connection point 12 is located from said first connection point 11. The pivot member 9 comprises a pivot part 16 extending from a side 35 of the frame 2. The first connection point 11, second connection point 12 and the third connection point 13 are located on said pivot part 16.

The vibration device 7 comprises a crankshaft 17 which is connected to the pivot member 9 at the second connection point 12 via a connecting rod 36. The crankshaft 17 provides a reliable construction for providing a vibrating movement of the cycling device 4 connected to the pivot member 9. Furthermore, in use the crankshaft 17 is relatively silent.

The training system 1 comprises a driving device 18 for driving the crankshaft 17. Said driving device 18 comprise a flywheel 20 which is rotatable around a flywheel axis 37. The flywheel 20 is mechanically coupled to the crankshaft 17 such that a rotational movement of the flywheel 20 is transmitted to the crankshaft 17. The flywheel 20 is also mechanically coupled to the cycling device 4 such that a rotational movement of the cycling members 5 around the cycling axis 6 is transmitted to the flywheel 20. This means that the crankshaft 17 is driven by the cycling device 4. The vibrating movement of the cycling members 5 is therefore driven by the rotation of said cycling members 5 around the cycle axis 6. The

vibration device 7 is in use driven by the user rotating the cycling members 5 around the cycle axis 6. The flywheel 20 is mechanically coupled to the crankshaft 17 by the two endless bodies 38 (each of them hereafter called endless driving body 38) and to the cycling device 4 by one endless body 39 (hereafter called endless cycling body 39). The cycling device 4 comprises a cycle disc 30 configured to rotate around the cycle axis 6 when the cycle members 5 are rotated around the cycle axis 6. The flywheel 20 comprises a first coupling member 51 for engaging the one of the endless driving bodies 38 and a second coupling member (not shown) for engaging the endless cycling body 39. The cycle disc 30 comprises a third coupling member 53 for engaging the endless cycling body 39. The crankshaft 17 comprises a fourth coupling member 54 for engaging the other of the endless driving bodies 38.

Due to the fact that the pivot member 9 is pivotable connected to the frame 2, the cycling device 4 makes in use a vibrating movement relative to the frame 2. This way, the vibrating movement of the cycling device 4 relative to the frame 2 is achieved by a simple and effective construction. The pivot member 9 is formed out of beam-like parts. In the training system 1, the cycle axis 6 in use makes a vibrating movement relative to frame 2. This provides an effective way to move the cycling members 5 in a vibrating manner. Furthermore, this ensures that the vibration of the cycle axis 6 is not (or at least in strongly reduced form) transferred to the frame 2. Due to this, a more effective vibration of the cycling member 5 is reached, because said vibration of the cycling device 4 is not damped by the frame 2. In addition to this a more comfortable training is provided, because a user supported by the frame via the seat member 8 and user support 34 is not (or in at least strongly reduced form) subjected to a vibrating movement of said seat member 8 and/or user support 34. If necessary, a damper (not shown) may be used to further reduce the transfer of the vibrating movement of the cycling device 4 to the frame 2. The training system 1 further comprises a base plate 41 connected to the vibration device 7. Said base plate 41 has a relatively large mass and provide stability to the training system 1.

Figure 2 shows an enlarged view of the part II of fig. 1. The vibrating movement of the pivot member 9 and the cycle axis 6 provided by the crankshaft 17 is shown by arrow 40.

Figure 3 shows a second embodiment of the training system 1 according the invention. In said training system 1 the flywheel 20 is coupled to the crankshaft 17 via a gearing device 21. The gearing device 21 is configured to select different gear ratios. The gear ratio is adjustable by the gear control 42 located on the user support 34. The gearing device 21 comprise a hub gear. By selecting a different gear ratio, the resistance to the rotation of the cycling members 5 around the cycle axis 6 is adjusted.

Figure 4 shows a third embodiment of the training system according the invention. In said training system 1 the driving device 18 comprises an electric motor 19 which is mechanically coupled to the crankshaft 17. The electric motor 19 is mechanically coupled to the crankshaft 17 by a driving belt 38. The flywheel 20 is mechanically coupled to the cycling device 4 by a driving chain 39. In the training system 1 the flywheel 20 is not mechanically coupled to crankshaft 17. The vibration device 7 is driven by the electrical motor 19. The flywheel 20 may mechanically be coupled to crankshaft 17. In said situation the vibration device 7 (more specifically the crankshaft 17) is driven by the electrical motor 19 and/or the cycling device 4.

Figure 5 shows a fourth embodiment of the training system according the invention. In the direction of the longitudinal axis 10 the second connection point 12 is located at a larger distance from the first connection point 11 than the third connection point 13 is located from said first connection point 11. A damper 15 is connected to the pivot member 9 at a fourth connection point 14 on the pivot member 9. The damper 15 is supported by a damping support 46. Said damper 15 provides additional stability to the vibrating movement of the pivot member 9. In the direction of the longitudinal axis 10 the third connection point 13 is located at a larger distance from the first connection point 11 than the fourth connection point 14 is located from said first connection point 11.

The vibration device 7 comprises eccentric weights which are rotatable connected to the pivot member 9 and an electric drive for rotating the eccentric weights. Said eccentric weights and electric drive form together a vibration motor 22. By rotating the at least one eccentric weights, a vibrating movement of said eccentric weights is created. The eccentric weights are connected to the pivot member 9 such that said vibrating movement is transferred to the pivot member 9. Due to this, the cycling device 4 moves in a vibrating manner. Said vibrating movement is shown by arrow 40.

The vibration motor 22 is controlled by a control unit 44. The user can adjust the vibrating movement of the cycling device 4 with a control panel 43 which communicates with the control unit 44.

Figure 6 shows a fifth embodiment of the training system according the invention. The vibration device 7 comprises a disc shaped member 24 which is connected to the cycling device 4 such that the disc shaped member 24 is rotatable around said cycle axis 6. A circumference 25 of the disc shaped member 24 comprises substantially radial extending protrusions 26. The vibration device 7 further comprises a bearing device 27 for bearing

against said circumference 25 such that a vibration is created when the disc shaped member 24 is rotated around the cycle axis 6. Said protrusions 26 of the circumference 25 of the disc shaped member 24 are formed by a curved form of said circumference 25. The central axis 24 of the disc shaped coincides with the cycle axis 6.

The bearing device 27 is configured to bear a contact member 28 against the circumference 25 of the disc shaped member 24. The contact member 28 is pushed against said circumference by a spring 45. The bearing device 27 is configured such that the contact member 28 is only displaceable in a direction radial to the cycle axis 6.

The cycle axis 6 is fixed to the frame 2. Therefore, the vibrating movement of the cycling members 5 is transferred to the frame 2.

The training system 1 further comprises an adjustable cycling resistor 33 for providing and adjusting a resistance to the rotation of the cycling members 5 around the cycle axis 6. By adjusting the resistance to the rotation of the cycling members 5 around the cycle axis, the magnitude of said resistance is adjusted. Said cycling resistor 33 and cycling device 4 is mechanically coupled by a driving chain 39.

Figure 7 shows a sixth embodiment of the training system according the invention. The training system 1 comprises a pivot member 9 which is pivotable connected to the frame 2. The bearing device 27 is fixed to the frame 2. The contact member 28 of the bearing device 27 is forced in contact with the circumference 25 of the disc shaped member 24 by a spring 29 working on the pivot member 9. In the direction of the longitudinal axis 10, the second connection point 12 and the third connection point 13 are positioned at the same distance from the first connection point 11.

Figure 8 shows a seventh embodiment of the training system according the invention. The cycling device 4 drives an endless body (driving chain 39) and the vibration device 7 is configured to vibrate said driving chain 39. The endless body may also be a driving belt or the like. The vibration device 7 is configured to drive an impact member 32 in an oscillating manner against the driving chain 39. The vibration device 7 is configured to drive the impact member 32 in an oscillating manner against opposite sides of the driving chain 39. The oscillating movement of the impact member 32 is shown be arrow 45. The vibration device 7 comprises a solenoid 31 to drive the impact member 32 in an oscillating manner. The impact on the driving chain 39 of the oscillating impact member 32 ensures that the cycling members 5 are moved in a vibrating manner.

Figure 9 shows an enlarged view of the part IX of fig. 8.

The figures 10 - 14 show an eighth embodiment of the training system according to the invention. The vibration device 7 comprises a crankshaft 17 connected to the pivot member 9. The crankshaft 17 is connected to the pivot member 17 at the second connecting point 12. The crankshaft 17 is connected to the frame 2 by a pivotable connecting bar 36.

The vibration device 7 is driven by the cycling device 4. The cycling device 4 comprises a cycle disc 30 configured to rotate around the cycle axis 6 when the cycle members 5 are rotated around said cycle axis 6. The cycling device 4 is mechanically coupled to the flywheel 20 such that a rotational movement of the cycle members 5 is transmitted to the flywheel 20. The cycle disc 30 comprises a third coupling member 53 for engaging a endless cycling body 39. The flywheel 20 comprises a second coupling member 52 for engaging said endless cycling body 39. This means that the cycling device 4 and the flywheel 20 are mechanically coupled to each other by only one endless cycling body 39. Said endless cycling body 39 may be any suitable type of endless body, such as an endless belt or endless chain. The endless cycling body 39 is guided by first guiding device (also referred to as first guiding means) 47. Said first guiding device 47 comprises a pair of roller guides.

The flywheel 20 is mechanically coupled to the crankshaft 17 such that a rotational movement of the flywheel 20 is transmitted to the crankshaft 17. The flywheel 20 is mechanically coupled to the crankshaft 17 by an endless driving body 38. The flywheel 20 comprises a first coupling member 51 for engaging the endless driving body 38. The crankshaft 17 comprises a fourth coupling member 54 for engaging said endless driving body 38. This means that the flywheel 20 and the crankshaft 17 are mechanically coupled to each other by only one endless driving body 38. Said endless driving body 38 may be any suitable type of endless body, such as an endless belt or endless chain. The endless cycling body 39 is guided by second guiding device (also referred to as second guiding means) 48. Said first guiding device 48 comprises a pair of roller guides.

It will be clear that the coupling of the flywheel 20 and/or the cycle disc 30 and/or the crankshaft 17 also covers a coupling of the flywheel axis 37 of the flywheel and/or the cycle axis 6 of the cycling device 4 and/or the axis of the crankshaft, such that rotational movements are transmitted between the flywheel 20 and/or the cycle disc 30 and/or the crankshaft 17, respectively. In said situation the first coupling member 51 and/or second coupling member 52 may be provided on the flywheel axis 37 at a distance from the flywheel 20 and/or the third coupling member 53 may be provided on the cycle axis 6 at a distance

from the cycle disc 30 and/or the fourth coupling member 54 may be provided on the axis of the crankshaft 17 at a distance from said crankshaft 17.

Figure 15 shows a side view of a side view of a first alternative embodiment of the cycling device and vibration device of the training system according the invention. The cycling device 4 comprises two cycling members 5 which are rotatable around the cycle axis 6. Each cycling member 5 comprises a cycling rod 56 and a thereto connected engage member 50 which is rotatably mounted around a member axis 49. The engage member 50 is connected to the cycling rod 56 via the vibration device 7. The engage member 50 is connected to the cycling rod 56 via a crankshaft 17. A cycle disc 30 which is rotatable around the cycling axis 6 is provided. The cycling device 4 is coupled to the cycle disc 30 such that the cycle disc 30 rotates when the cycling device 4 is rotated around the cycling axis 6. The cycle disc 30 is coupled to the vibration device 7, and thus to the crankshaft 17, of each cycling member 5 by an endless driving body 38. When the cycling members 5 are rotated around the cycling axis 6, the cycle disc 30 will drive the crankshafts 17 of each cycling member 5 via the endless driving bodies 38. The driving of the crankshafts 17 causes that the engage members 50 vibrates as indicated by arrow 40. It will be clear that any suitable vibration device 7 other than a crankshaft 17 may be used. The cycle disc 30 may also be connected to a cycling resistor 33.

Figures 16 and 17 shows a side view of a side view of a second and third alternative embodiment of the cycling device and vibration device of the training system according the invention, respectively. In these embodiments, the cycle disc 30 is configured such that said cycle disc 30 is directly in contact with the vibration device 7 for driving of said vibration device 7. The cycle disc 30 is fixed relative to the cycling axis 6. This means that the cycle disc 30 does not rotate around the cycling axis 6 when the cycling members 5 are rotated around the cycling axis 6. The cycle disc 30 may be configured such that said cycle disc 30 substantially does not rotate around the cycling axis 6 when the cycling members 5 are rotated around the cycling axis 6. The crankshaft 17 is in contact with the disc circumference 55 of the cycle disc 30. In the embodiment of fig. 16, the crankshaft 17 is in contact with an outer surface 58 of said disc circumference 55. In the embodiment of fig. 17, the crankshaft 17 is in contact with an inner surface 58 of said disc circumference 55. By rotation of the cycling members 5 relative to the cycle disc 30 the crankshaft 17 is driven such that the engage members 50 vibrate as indicated by arrow 40.

Figure 18 shows a side view of a fourth alternative embodiment of the cycling device and vibration device of the training system according the invention. The cycling device 4 is configured such that the cycling device 4 is rotatable around the cycling axis 6 via a

crankshaft 17. This causes that rotation of the cycling members 5 around the cycling axis 6 results in a vibration of the cycling member 5 as indicated by arrow 40. The cycling device 4 may be coupled to a flywheel 20 such that the flywheel 20 rotates around the cycling axis 6 when the cycling members 5 are rotated around the cycling axis 6.

Figure 19 shows a side view of a fifth alternative embodiment of the cycling device and vibration device of the training system according the invention. The cycling device 4 comprises a cycle disc 30 which is coupled to a flywheel 20 by an endless cycling body 39. The flywheel 20 is rotatable about a flywheel axis 37. The flywheel 20 is connected to the cycling device 4 by a pivot member 9. The pivot member 9 is pivotable about a pivot axis 57. The pivot axis 57 is fixed relative to the cycling device 4. The pivot member 9 is at a first end 61 thereof connected to the cycling device 4 and at a second end 62 thereof to the flywheel 20. The pivot axis 57 is located between the first and second end 61 and 62 of the pivot member 9. The pivot member 9 is connected to the flywheel 20 at an eccentric connection point 60. The eccentric connection point 60 is slidably connected to pivot member 9. The eccentric connection point 60 is slidable through an aperture 61 provided in the pivot member 9. Rotation of the flywheel 20 causes that the second end 62 of the pivot member 9 vibrates as indicated by arrow 63. Due the pivot axis 57, said movement of the second end 62 is transferred to the first end 61 of the pivot member 9 such that said first end 61 vibrates as indicated by arrow 40. This results in a vibration of the cycling members 5.

The figures 20-25 show a ninth embodiment of the training system according to the invention. The reference numbers 8 and 34 indicate where the seat member and user support (not shown) respectively in use are positioned. In use two cycling members (not shown) are connected to the cycling axis 6. The cycle disc 30 is configured to rotate around the cycle axis 6 when the two cycle members are rotated around the cycle axis 6.The cycle disc 30 is coupled to the flywheel 20 by an endless body, more specifically the endless cycling body 39.

The driving device 18 is coupled to the vibration device 7 by the endless driving body 38. The vibration device 7 comprises a crankshaft 17. The crankshaft 17 is connected to the cycle axis 6 and configured to move the cycle axis 6 in a vibrating manner 40. The crankshaft 17 comprises a crankshaft axis 63 around which the crankshaft 17 rotates. The cycle axis 6 is located at a distance from the crankshaft axis 63. The crankshaft 17 is configured to rotate the cycle axis 6 around the crankshaft axis 63 as indicated by arrow 40 of fig. 25. Said vibrating movement 40 of the cycle axis 6 can be divided in a horizontal movement A_h and a vertical movement A_v. The crankshaft 17 is connected to the frame 2 by bearings 78. In use the crankshaft axis 63 is located in a fixed position relative to the frame 2.

The cycle axis 6 is directly connected to the cycle disc 30 such that the cycle disc 30 vibrates along with the cycle axis 6 when the cycle axis 6 is moved in a vibrating manner 40. The crankshaft 17 comprises a first eccentric weight and second eccentric weight (see 97 of fig. 25) for compensating the forces induced by the vibrating movement of the cycle axis and the cycle disc 30, respectively. The first eccentric weight and second eccentric weight are integrated into each other to form one eccentric weight 97. Fig. 25 shows a cross sectional view along the line as indicated in fig. 22.

The training system 1 comprises a tensioning device 68 for tensioning the endless cycling body 39 when the cycle disc 30 is moved in a vibrating manner. The tensioning device 68 engages the endless cycling body 39 by means of a first tensioning roller 69 and a second tensioning roller 70. The first tensioning roller 69 and the second tensioning roller 70 are rotatable about rotation axis 76 and 77. The first tensioning roller 69 and second tensioning roller 70 are connected to the crankshaft 17 via a roller support 72. The roller support 72 is pivotable connected tot the crankshaft 17 such that the tensioning device 68 in use is moved in opposite phase when compared to the vibrating movement 40 of the cycle axis 6. This means that when the cycle axis 6 moves in a direction, the tensioning device moves in the opposite direction. The tensioning movement of the tensioning device 68 is indicated by arrow 71. Said tensioning movement 71 ensures that the first tensioning roller 69 and second tensioning roller 70 engage the endless cycling belt 39 such that the endless cycling belt 39 remains under tension when the cycle disc 30 is moved by the vibrating cycle axis 6.

The training system 1 comprises a coupling device 64 for coupling the driving device 18 to the vibration device 7 and for decoupling the driving device 18 from the vibration device 7. The coupling device 64 comprises a coupling control member 75 for controlling the coupling and decoupling between the coupling device 64 and the vibration device 7. The coupling device 64 comprises a coupling roller 65 which is movable between a coupled position 66 and an uncoupled position 67. The coupling roller 65 is mounted on a coupling bar 73 and rotatable around rotation axis 74. The coupling bar 73 is moveable by means of the coupling control member 75 such that the coupling roller 65 is positionalbe in the coupled position 66 or the uncoupled position 67. In the coupled position 66 the coupling roller 65 engages the flywheel 20 such that a rotation of the flywheel 20 is transmitted to the coupling roller 65 (see fig. 20 and 21). This way, the driving device 18 is driven by the cycling device 4. In the uncoupled position 67 the coupling roller 65 does not engage the flywheel 20 so that a rotation of the flywheel 20 is not transmitted to the coupling roller 65 (see fig. 22 and 23).

Figure 24B shows a modification of the training system of fig. 20-23, 24A and 25. A gearing device 21 is coupled to the driving device 18, more specifically to the endless driving belt 38 via the coupling axis 74 of the coupling roller 65. The gearing device 26 is in communication connection with the gear control 42 (see fig. 20) via communication member 99. The gearing device 21 is configured to provide different gear ratios. The gear ratio is adjustable by the gear control 42. The gearing device 21 comprises a hub gear. By controlling the gear ratio, the driving of the vibration device 7 is controlled. This means that the gearing device 21 allows the user to control the frequency with which the vibration device 7 moves the cycle axis 6 in a vibrating manner.

The figures 26-27 show a tenth embodiment of the training system according to the invention.

The figures 28-29 show an eleventh embodiment of the training system according to the invention. The cycle disc 30 engages the endless cycling body 39 at a first engaging region 95 and a second engaging region 96. A tensioning guide 79 engages the endless cycling body 39 between the first engaging region 95 and the second engaging region 96. The first engaging region 95 and the second engaging region 96 are located at a distance from each other. This allows that the endless cycling belt 39 remains under tension when the cycle disc 30 is moved by the vibrating movement of the cycle axis 6. The tensioning guide 79 comprises a tensioning roller 80.

The figures 30-32 show a twelfth embodiment of the training system according to the invention. The cycle axis 6 is coupled to the cycle disc 30 via a damping coupling 81 to reduce the transfer of the vibrating movement 40 of the cycle axis 6 to the cycle disc 30. The damping coupling 81 comprises elastic material to reduce the transfer of the vibrating movement 40 of the cycle axis 6 to the cycle disc 30. The damping coupling 81 comprises a rubber bushing surrounding the cycle axis 6. Fig. 31 shows a cross sectional view along the line as indicated in fig. 30.

The figures 33-34 show a thirteenth embodiment of the training system according to the invention. The cycling device 4 is coupled to a first wheel 82 via the endless cycling belt 39. The coupling device 64 is coupled to the first wheel 82 to drive the vibration device 7. The training system 1 further comprises a second wheel 83 which can be steered by the user support 34.

The figures 35-36 show a fourteenth embodiment of the training system according to the invention. The driving device comprises an endless driving belt 38 which directly couples the vibration device 7 to the first wheel 82.

Figure 37 show a fifteenth embodiment of the training system according to the invention. Foot supports 85 are at one end thereof pivotable (about pivot axis 87) connected to the cycling members 5. At the other end thereof, the foot supports 85 are pivotable (about pivot axis 88) connected to hand rods 84. The hand rods 84 are pivotable (about pivot axis 86) connected to the frame 2. In use the foot supports 85 make an elliptical movement.

The figures 38-40 show a sixteenth embodiment of the training system according to the invention. The cycle axis 6 is connected to a connecting member 89. The connecting member 89 is located in a member guide 90. The member guide 90 guides the connecting member 89 such that the connecting member 89 is movable along a substantially straight line. The connecting member 89 rests on a damper 15. The cycle axis 6 is connected to the vibration device 7 via the connecting member 89. The vibration device 7 comprises an eccentric weight 92 which is rotatable around eccentric weight axis 93. The vibration device 7 comprises a coupling member 91 which is rotatable around the eccentric weight axis 93 and coupled to the cycle disc 30 by a endless body 94 for driving the vibration device 7. When the cycling members 5 are rotated around the cycle axis 6, the cycle disc 30 drives the vibration device 7 such that the eccentric weight 92 is rotated around the eccentric weight axis 93 to create a vibrating movement 40 of the connecting member 89 and therefore also the cycle axis 6. Due to the member guide 90, the cycle axis 6 vibrates along a substantially straight line. Fig. 40 shows an exploded view of the training system 1.

The application may be defined by one or any combination of the following clauses.

1. Training system for training a body part of a user, comprising
   a frame for in use positioning the training system on a surface,
   a cycling device comprising at least one cycling member which is configured to rotate around a cycle axis,
   a vibration device for moving the at least one cycling member in a vibrating manner.

2. Training system according to clause 1, wherein the vibration device is configured to move the cycle axis in a vibrating manner.

3. Training system according to any of the preceding clauses, wherein the training system is configured such that in use the cycle axis moves relative to the frame in a vibrating

manner.

4. Training system according to any of the preceding clauses, wherein the cycling device is connected to the frame such that the cycle axis is movable relative to the frame in a vibrating manner.

5. Training system according to any of the preceding clauses, wherein the vibration device comprises a crankshaft which is connected to the cycle axis and configured to move the cycle axis in a vibrating manner.

6. Training system according to clause 5, wherein the crankshaft comprises a crankshaft axis, the cycle axis is located at a distance from the crankshaft axis, and the crankshaft is configured to rotate the cycle axis around the crankshaft axis.

7. Training system according to any of the clauses 5-6, wherein the crankshaft is connected to the frame such that the crankshaft axis is located in a substantially fixed position relative to the frame.

8. Training system according to any of the clauses 5-7, wherein the crankshaft comprises a first eccentric weight for compensating the forces induced by the vibrating movement of the cycle axis.

9. Training system according to any of the preceding clauses, wherein the cycling device comprises a cycle disc configured to rotate around the cycle axis when the at least one cycle member is rotated around said cycle axis.

10. Training system according to clause 9, wherein the cycle disc engages an endless body.

11. Training system according to any of the clauses 9-10, wherein the vibration device is configured the move the cycle disc in a vibrating manner.

12. Training system according to clause 11 in combination with any of the clauses 5-8, wherein the crankshaft comprises a second eccentric weight for compensating the forces induced by the vibrating movement of the cycle disc.

13. Training system according to any of the clauses 9-10, wherein the cycle axis is coupled to the cycle disc via a damping coupling to reduce the transfer of the vibrating movement

of the cycle axis to the cycle disc.

14. Training system according to clause 13, wherein the damping coupling comprises elastic material to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc.

15. Training system according to any of the clauses 13-14, wherein the damping coupling comprises an elastic bushing to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc, which elastic bushing surrounds the cycle axis.

16. Training system according to any of the clauses 13-15, wherein the damping coupling comprises a rubber bushing to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc, which rubber bushing surrounds the cycle axis.

17. Training system according to any of the clauses 10-16, wherein the training system comprises a tensioning device for tensioning the endless body engaged by the cycle disc.

18. Training system according to clause 17, wherein the tensioning device engages the endless body and is connected to the crankshaft such that the tensioning device in use moves in opposite phase when compared to the vibrating movement of the cycle axis.

19. Training system according to clause 17-18, wherein the tensioning device comprises at least one tensioning roller engaging the endless body and a roller support, which roller support connects said at least one tensioning roller to the crankshaft and in use moves in opposite phase when compared to the vibrating movement of the cycle axis.

20. Training system according to any of the clauses 10-19, wherein the cycle disc engages the endless body at a first engaging region and a second engaging region and a tensioning guide engages the endless body between the first engaging region and the second engaging region.

21. Training system according to clause 20, wherein the first engaging region and the second engaging region are located at a distance from each other.

22. Training system according to any of the preceding clauses, wherein the training system comprises a driving device for driving the vibration device.

23. Training system according to clause 22, wherein the driving device is configured to be driven by the cycling device.

24. Training system according to any of the clauses 22-23, wherein the training device comprises a coupling device for coupling the driving device to the vibration device and for decoupling the driving device from the vibration device.

25. Training system according to clause 24, wherein the coupling device comprises a coupling control member for controlling the coupling and decoupling between the coupling device and the vibration device.

26. Training system according to any of the preceding clauses, wherein the frame comprises a seat member and the cycle axis is movable relative to the seat member in a vibrating manner.

27. Training system according to any of the preceding clauses, wherein the cycling device is pivotally connected to the frame such that the cycle axis is movable relative to the frame in a vibrating manner.

28. Training system according to any of the preceding clauses, wherein the cycling device is connected to the frame via a pivot member.

29. Training system according to any of the preceding clauses, wherein the pivot member comprises a longitudinal axis.

30. Training system according to any of the preceding clauses, wherein the pivot member is pivotable connected to the frame at a first connection point on the pivot member.

31. Training system according to any of the preceding clauses, wherein the vibration device is connected to the pivot member at a second connection point on the pivot member.

32. Training system according to any of the preceding clauses, wherein the first connection point and the second connection point are in the direction of the longitudinal axis located at a distance from each other.

33. Training system according to any of the preceding clauses, wherein the cycling device is connected to the pivot member at a third connection point on the pivot member.

34. Training system according to any of the preceding clauses, wherein in the direction of the longitudinal axis the third connection point is located at a larger distance from the first connection point than the second connection point is located from said first connection point.

35. Training system according to any of the preceding clauses, wherein in the direction of the longitudinal axis the second connection point is located at a larger distance from the first connection point than the third connection point is located from said first connection point.

36. Training system according to any of the preceding clauses, wherein in the direction of the longitudinal axis the second connection point is located at the same distance from the first connection point as the third connection point is located from said first connection point.

37. Training system according to any of the preceding clauses, wherein a damper is connected to the pivot member at a fourth connection point on the pivot member.

38. Training system according to any of the preceding clauses, wherein in the direction of the longitudinal axis the third connection point is located at a larger distance from the first connection point than the fourth connection point is located from said first connection point.

39. Training system according to any of the preceding clauses, wherein in the direction of the longitudinal axis the fourth connection point is located at a larger distance from the first connection than the third connection point is located from said first connection point.

40. Training system according to any of the preceding clauses, wherein in the direction of the longitudinal axis the third connection point is located at the same distance from the first connection point as the fourth connection point is located from said first connection point.

41. Training system according to any of the preceding clauses, wherein the pivot member comprises a pivot part extending from a side of the frame and the first connection point and/or second connection point and/or third connection point and/or fourth connection point are located on said pivot part.

42. Training system according to any of the preceding clauses, wherein the vibration device comprises a crankshaft connected to the pivot member.

43. Training system according to any of the preceding clauses, wherein the crankshaft is connected to the pivot member at the second connecting point.

44. Training system according to any of the preceding clauses, wherein the training system comprises a driving device for driving the crankshaft.

45. Training system according to any of the preceding clauses, wherein the driving device comprises an electrical motor which is coupled to the crankshaft.

46. Training system according to any of the preceding clauses, wherein the vibration device is driven by the cycling device.

47. Training system according to any of the preceding clauses, wherein the crankshaft is driven by the cycling device.

48. Training system according to any of the preceding clauses, wherein the driving device comprises a flywheel which is coupled to the crankshaft.

49. Training system according to any of the preceding clauses, wherein the flywheel is coupled to the crankshaft such that a rotational movement of the flywheel is transmitted to the crankshaft.

50. Training system according to any of the preceding clauses, wherein the flywheel is coupled to the crankshaft by an endless driving body.

51. Training system according to any of the preceding clauses, wherein the flywheel is coupled to the crankshaft by at least one endless driving body.

52. Training system according to any of the preceding clauses, wherein the flywheel is coupled to the crankshaft by only one endless driving body.

53. Training system according to any of the preceding clauses, wherein the flywheel is coupled to the crankshaft via a gearing device.

54. Training system according to any of the preceding clauses, wherein the flywheel is driven by the cycling device.

55. Training system according to any of the preceding clauses, wherein the cycling device is coupled to the flywheel for driving said flywheel.

56. Training system according to any of the preceding clauses, wherein the flywheel is coupled to the cycling device such that a rotational movement of the at least one cycle member is transmitted to the flywheel.

57. Training system according to any of the preceding clauses, wherein the cycling device is coupled to the flywheel by an endless cycling body.

58. Training system according to any of the preceding clauses, wherein the cycling device is coupled to the flywheel by at least one endless cycling body.

59. Training system according to any of the preceding clauses, wherein the cycling device is coupled to the flywheel by only one endless cycling body.

60. Training system according to any of the preceding clauses, wherein the flywheel comprises a first coupling member for engaging the endless driving body.

61. Training system according to any of the preceding clauses, wherein the flywheel comprises a second coupling member for engaging the endless cycling body.

62. Training system according to any of the preceding clauses, wherein the cycling device is coupled to the flywheel via a gearing device.

63. Training system according to any of the preceding clauses, wherein the cycling device comprise a third coupling member for engaging the endless cycling body.

64. Training system according to any of the preceding clauses, wherein the cycling device comprise a cycle disc configured to rotate around the cycle axis when the at least one cycle member is rotated around said cycle axis.

65. Training system according to any of the preceding clauses, wherein the cycle disc comprises the third coupling member.

66. Training system according to any of the preceding clauses, wherein the vibration device comprise a fourth coupling member for engaging the endless cycling body.

67. Training system according to any of the preceding clauses, wherein the crankshaft comprises the fourth coupling member.

68. Training system according to any of the preceding clauses, wherein the vibration device comprises at least one eccentric weight which is rotatable connected to the pivot member and an electric drive for rotating the eccentric weights such that the pivot member moves is a vibrating manner.

69. Training system according to any of the preceding clauses, wherein the vibration device comprises
- a disc shaped member which is connected to the cycling device such that the disc shaped member is rotatable around said cycle axis and wherein a circumference of the disc shaped member comprises substantially radial extending protrusions, and
- bearing device for bearing against said circumference such that the at least one cycling member moves in a vibrating manner when the disc shaped member is rotated around the cycle axis.

70. Training system according to any of the preceding clauses, wherein the bearing device is configured to force a contact member against the circumference of the disc shaped member.

71. Training system according to any of the preceding clauses, wherein the bearing device is configured such that the contact member is only displaceable in a direction radial to the cycle axis.

72. Training system according to any of the preceding clauses, wherein the cycling device drive an endless body and the vibration device is configured to vibrate the endless body such that the at least one cycling member moves in a vibrating manner.

73. Training system according to any of the preceding clauses, wherein the vibration device is configured to drive an impact member against the endless body in an oscillating manner.

74. Training system according to any of the preceding clauses, wherein the training system comprises an adjustable cycling resistor for providing and adjusting a resistance to the

rotation of the cycling member around the cycle axis.

75. Training system according to any of the preceding clauses, wherein the cycle axis is fixed to the frame.

76. Training system according to any of the preceding clauses, wherein the cycle axis is a fictive cycle axis.

77. Training system according to any of the preceding clauses, wherein the cycle axis is a fictive cycle axis and the cycling device is configured to rotate around said fictive cycle axis.

78. Training system according to any of the preceding clauses, wherein the cycle axis is a fictive cycle axis defining a cycle centre and the cycling device is configured to rotate around said cycle centre.

79. Training system according to any of the preceding clauses, wherein the cycle axis is a fictive axis defining a cycle centre around which the cycling device in use are rotated.

80. Training system for training a body part of a user, comprising
a frame for in use positioning the training system on a surface,
a cycling device comprising at least one cycling member which is configured to rotate around a cycle centre,
a vibration device for moving the at least one cycling member in a vibrating manner.

81. Training system according to clause 59, wherein the training system comprises one or more features of one or more of any of the preceding clauses.

82. Training system according to any of the preceding clauses, wherein the cycling device is configured to rotate substantially in a circle around the cycle axis and/or fictive cycle axis and/or cycle centre.

83. Training system according to any of the preceding clauses, wherein the cycling device is configured to rotate substantially in an ellipse around the cycle axis and/or fictive cycle axis and/or cycle centre.

84. Training system according to any of the preceding clauses, wherein the cycling device is configured to rotate substantially in an ellipse around the cycle axis and/or fictive cycle

axis and/or cycle centre such that the movement thereof simulates a Nordic ski motion.

85. Training system according to any of the preceding clauses, wherein the cycling device is configured to rotate substantially in an ellipse around the cycle axis and/or fictive cycle axis and/or cycle centre such that the movement thereof simulates a Nordic ski motion with the feet of the user.

86. Training system according to any of the preceding clauses, wherein the training system comprises at least one movable hand rod configured to be engaged by the user and the training system is configured to vibrate the at least one movable hand rod.

87. Training system according to any of the preceding clauses, wherein the training system comprises two hand rods configured to be engaged by the user and the training system is configured to vibrate the two movable hand rods.

88. Training system according to any of the preceding clauses, wherein the training system comprises additional vibration device for vibrating the at least one movable hand rods and/or two movable hand rods.

89. Training system according to any of the preceding clauses, wherein the vibration device is configured for vibrating the at least one movable hand rods and/or two movable hand rods.

90. Training system according to any of the preceding clauses, wherein the hand rods are movable such that the movement thereof simulates a Nordic ski motion.

91. Training system according to any of the preceding clauses, wherein the hand rods are movable such that the movement thereof simulates a Nordic ski motion with the hands of the user.

92. Training system according to any of the preceding clauses, wherein the training system comprises one or any combination of the features disclosed in the description and/or drawings.

93. Method of training a body part of a user comprising the rotating of the at least one cycle member around the cycle axis of the training system according to any of the preceding clauses.

94. Method of training a body part of a user comprising the rotating of the at least one cycle member around the cycle centre of the training system according to any of the preceding clauses.

95. Use of the training system according to any of the clauses 1 – 92.

It will be clear to the person skilled in the art that many modifications of the training system, method and use of the training system according the invention are possible without departing from the scope of protection as defined in the patent application.

CLAIMS

1. Training system for training a body part of a user, comprising
a frame for in use positioning the training system on a surface,
a cycling device comprising at least one cycling member which is configured to rotate around a cycle axis,
a vibration device for moving the at least one cycling member in a vibrating manner.

2. Training system according to claim 1, wherein the vibration device is configured to move the cycle axis in a vibrating manner.

3. Training system according to any of the preceding claims, wherein the training system is configured such that in use the cycle axis moves relative to the frame in a vibrating manner.

4. Training system according to any of the preceding claims, wherein the cycling device is connected to the frame such that the cycle axis is movable relative to the frame in a vibrating manner.

5. Training system according to any of the preceding claims, wherein the vibration device comprises a crankshaft which is connected to the cycle axis and configured to move the cycle axis in a vibrating manner.

6. Training system according to claim 5, wherein the crankshaft comprises a crankshaft axis, the cycle axis is located at a distance from the crankshaft axis, and the crankshaft is configured to rotate the cycle axis around the crankshaft axis.

7. Training system according to any of the claims 5-6, wherein the crankshaft is connected to the frame such that the crankshaft axis is located in a substantially fixed position relative to the frame.

8. Training system according to any of the claims 5-7, wherein the crankshaft comprises a first eccentric weight for compensating the forces induced by the vibrating movement of the cycle axis.

9. Training system according to any of the preceding claims, wherein the cycling device comprises a cycle disc configured to rotate around the cycle axis when the at least one

cycle member is rotated around said cycle axis.

10. Training system according to claim 9, wherein the cycle disc engages an endless body.

11. Training system according to any of the claims 9-10, wherein the vibration device is configured the move the cycle disc in a vibrating manner.

12. Training system according to claim 11 in combination with any of the claims 5-8, wherein the crankshaft comprises a second eccentric weight for compensating the forces induced by the vibrating movement of the cycle disc.

13. Training system according to any of the claims 9-10, wherein the cycle axis is coupled to the cycle disc via a damping coupling to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc.

14. Training system according to claim 13, wherein the damping coupling comprises elastic material to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc.

15. Training system according to any of the claims 13-14, wherein the damping coupling comprises an elastic bushing to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc, which elastic bushing surrounds the cycle axis.

16. Training system according to any of the claims 13-15, wherein the damping coupling comprises a rubber bushing to reduce the transfer of the vibrating movement of the cycle axis to the cycle disc, which rubber bushing surrounds the cycle axis.

17. Training system according to any of the claims 10-16, wherein the training system comprises a tensioning device for tensioning the endless body engaged by the cycle disc.

18. Training system according to claim 17, wherein the tensioning device engages the endless body and is connected to the crankshaft such that the tensioning device in use moves in opposite phase when compared to the vibrating movement of the cycle axis.

19. Training system according to claim 17-18, wherein the tensioning device comprises at least one tensioning roller engaging the endless body and a roller support, which roller support connects said at least one tensioning roller to the crankshaft and in use moves in

opposite phase when compared to the vibrating movement of the cycle axis.

20. Training system according to any of the claims 10-19, wherein the cycle disc engages the endless body at a first engaging region and a second engaging region and a tensioning guide engages the endless body between the first engaging region and the second engaging region.

21. Training system according to claim 20, wherein the first engaging region and the second engaging region are located at a distance from each other.

22. Training system according to any of the preceding claims, wherein the training system comprises a driving device for driving the vibration device.

23. Training system according to claim 22, wherein the driving device is configured to be driven by the cycling device.

24. Training system according to any of the claims 22-23, wherein the training system comprises a coupling device for coupling the driving device to the vibration device and for decoupling the driving device from the vibration device.

25. Training system according to claim 24, wherein the coupling device comprises a coupling control member for controlling the coupling and decoupling between the coupling device and the vibration device.

26. Training system according to any of the preceding claims, wherein the training system comprises one or any combination of the features of the clauses 1- 92.

27. Method of training a body part of a user comprising using said body part for rotating the at least one cycle member around the cycle axis of the training system according to any of the preceding claims.

28. Use of the training system according to any of the claims 1 – 26.