CLAIMS

What is claimed is:

1. An integrated control device for a bicycle, comprising a support body configured to be fixed to a handlebar of a bicycle, and a single lever that is mobile with respect to the support body to command both a brake, and a derailleur in two first and second substantially opposite directions of movement, wherein the single lever:

has a rest position in which it commands neither the brake nor the derailleur,

moves in a first direction to command the brake, and

moves in a second direction, different from the first direction, by a first distance to command movement of the derailleur in the first derailleur direction and by a second distance different from the first distance to command movement of the derailleur in the second derailleur direction.

2. A device according to claim 1, wherein the second direction is substantially perpendicular to the first direction.

3. A device according to claim 1, wherein the movement of the derailleur in the first derailleur direction corresponds to downward gearshifting and the movement of the derailleur in the second derailleur direction corresponds to upward gearshifting.

4. A device according to claim 1, wherein the movement of the derailleur in the first derailleur direction corresponds to upward gearshifting and the movement of the derailleur in the second derailleur direction corresponds to downward gear shifting.

5. A device according to claim 1, wherein the support body is configured to be gripped in a hand.

6. A device according to claim 1, further comprising an intermediate body, which is supported so that it can move in rotation with respect to the support body about a first rotational axis, said single lever moves in rotation with respect to the intermediate body about a second rotational axis, different from the first.

7. A device according to claim 6, wherein when the single lever is in the rest position, said second rotational axis substantially points in the direction of movement of the bicycle and said first rotational axis substantially points in a transversal direction with respect to the direction of movement of the bicycle.

8. A device according to claim 7, wherein said first rotational axis is substantially horizontal.

9. A device according to claim 7, wherein said first rotational axis is substantially vertical.

10. A device according to claim 6, wherein the intermediate body comprises a seat for receiving a widened head of a brake control cable.

11. A device according to claim 6, further comprising a connecting rod mounted so that it moves in rotation with respect to the intermediate body about the second rotational axis, wherein the single lever is hinged to the connecting rod according to a third rotational axis, different from the second rotational axis and parallel thereto, wherein the single lever is angularly mobile with respect to the connecting rod about the third rotational axis between the rest position and a deviated position, and wherein the connecting rod is angularly mobile with respect to the intermediate body about the second rotational axis between a rest position and at least one deviated position.

12. A device according to claim 11, further comprising a first elastic member between the connecting rod and the intermediate body to push the connecting rod into its rest position, and a second elastic member between the single lever and the connecting rod to push the single lever into its rest position.

13. A device according to claim 12, wherein the first elastic member exerts a push on the connecting rod that prevails over the second elastic member, so that a push on the single lever first moves the single lever into the deviated position without moving the connecting rod, and subsequently moves the connecting rod.

14. A device according to claim 11, suitable for commanding a derailleur actuated by a control cable, the device further comprising:

a cable-winding bush, supported so that it rotates on the support body, on which bush the derailleur control cable is wound,

an indexing mechanism that comprises a gear wheel supported so that it can move in rotation on the intermediate body about the second rotational axis between a predetermined number of predetermined angular positions corresponding to the desired positions of the derailleur,

a transmission mechanism between the cable-winding bush and the gear wheel of the indexing mechanism, that causes a rotation of the gear wheel to correspond to a rotation of the cable-winding bush.

15. A device according to claim 14, wherein the transmission mechanism (28) comprises a sliding connection (80) that allows movement of said indexing mechanism (12) with respect to said cable-winding bush (19).

16. A device according to claim 15, wherein the transmission mechanism allows a rotation of said intermediate body about said first axis.

17. A device according to claim 16, wherein said sliding connection comprises at least one slot that slidably receives a projecting element associated with said cable-winding bush and/or with said gear wheel.

18. A device according to claim 16, wherein said transmission mechanism comprises an intermediate shaft, a first Hooke's joint and a second Hooke's joint, said first Hooke's joint connecting said intermediate shaft to said gear wheel of said indexing mechanism and said second Hooke's joint connecting said intermediate shaft to said cable-winding bush.

19. A device according to claim 14, wherein:

the gear wheel comprises each of a first and a second sector, in each of which respective first and second teeth are formed that between them define a number of spaces at least equal to said predetermined number of angular positions;

the single lever comprises a driven arm facing towards the first sector, provided with a first ratchet of a shape compatible with the shape of a space of the first sector;

the device further comprising:

a rocker arm, hinged to the intermediate body according to a fourth rotational axis and provided with a first arm facing towards the driven arm of the single lever and with a second arm facing towards the second sector and equipped with a second ratchet of a shape compatible with the shape of a space of the second sector, and

a third elastic member between the intermediate body and the rocker arm to push the rocker arm with its second arm towards the second sector;

wherein:

the driven arm of the single lever pushes on the first arm of the rocker arm against the push of the third elastic member when the single lever is moved from its rest position towards its deviated position.

20. A device according to claim 19, wherein each of the spaces of the first and second sector are defined by an active side and by an inactive side, the active side facing, with respect to the space, in a first direction of rotation of the gear wheel corresponding to a direction of rotation of the cable-winding bush during winding of the derailleur control cable.

21. A device according to claim 20, wherein when the lever and the connecting rod are in their rest positions, the first ratchet is not engaged with any space of the first sector whereas the second ratchet is engaged in one of the spaces of the second sector, the second ratchet abuts the active side of the space, so as to prevent rotation of the gear wheel in a second direction of rotation opposite the first direction of rotation.

22. A device according to claim 21, wherein, when the lever is taken from its rest position into its deviated position without the connecting rod moving from its rest position, the first ratchet is taken into partial engagement in one of the spaces of the first sector, distanced from the active side, whereas the second ratchet is taken out of engagement with the space of the second sector, so that the gear wheel can rotate in the second direction of rotation due to the tension of the derailleur control cable, sufficient so that the first ratchet moves against the active side of the space in which it is engaged while the second ratchet moves to a position in front of an adjacent space.

23. A device according to claim 22, wherein, when the lever is taken back from its deviated position to its rest position, without the connecting rod moving from its rest position, the second ratchet goes into engagement with the space that it was opposite to, while the first ratchet is taken out of engagement with the space in which it was engaged.

24. A device according to claim 22, wherein, when the connecting rod is taken from its rest position to its deviated position, with the lever remaining in its deviated position with respect to the connecting rod, the first ratchet remains engaged in the space and pushes the active side of the space, making the gear wheel rotate in the first direction, whereas the second ratchet is pressed by the third elastic member against the gear wheel and slides on the inactive side of the spaces without opposing the rotation of the gear wheel.

25. A device according to claim 24, wherein, when the connecting rod and the lever are returned to their rest positions, the first ratchet is taken out of engagement with the gear wheel whereas the second ratchet remains engaged in one of the spaces, preventing the rotation of the gear wheel in the second direction.

26. A device according to claim 11, suitable for commanding a derailleur actuated by a servo-assisted system, comprising a first movement detector between said single lever and said connecting rod and a second movement detector between said connecting rod and said intermediate body.

27. A device according to claim 26, wherein the first movement detector is a first contact detector actuated by a contact between the connecting rod and a driven arm of the single lever when the single lever reaches its deviated position, and wherein the second movement detector is a second contact detector actuated by a contact between a projection of the connecting rod and said intermediate body when the connecting rod reaches its deviated position.

28. A device according to claim 27, wherein the first contact detector is provided in a seat on the connecting rod.

29. A device according to claim 26, wherein the second contact detector is provided in a seat on the intermediate body .

30. A device according to claim 26, wherein said servo-assisted system comprises an electric motor.

31. An integrated control device for a bicycle, comprising a support body configured to be fixed to a handlebar of a bicycle, and a single lever that is mobile with respect to the support body for commanding a brake, and a derailleur in two first and second substantially opposite directions of movement, through a servo-assisted system, wherein the single lever has:

a rest position in which it commands neither the brake nor the derailleur;

moves in a first direction to command the brake;

moves in a second direction, different from the first direction to command movement of the derailleur in the first derailleur direction; and

moves in a third direction, different from the first direction to command movement of the derailleur in the second derailleur direction.

32. A device according to claim 31, wherein the second and third directions are the same.

33. A device according to claim 31, wherein the second and third directions are opposite.

34. An electric control device for a bicycle for commanding a derailleur in each of a first and second derailleur direction of movement, opposite one another, through a servo-assisted system, comprising a support body configured to be fixed to a handlebar of a bicycle, and a single lever that moves with respect to the support body for commanding the derailleur, wherein the lever moves in a single direction from a rest

position in which it does not command the derailleur, by a first distance to command movement of the derailleur in the first derailleur direction and by a second distance different from the first distance to command movement of the derailleur in the second derailleur direction.

35. A device according to claim 34, wherein the movement of the derailleur in the first derailleur direction corresponds to downward gearshifting and the movement of the derailleur in the second derailleur direction corresponds to upward gearshifting.

36. A device according to claim 34, wherein the movement of the derailleur in the first derailleur direction corresponds to upward gearshifting, and the movement of the derailleur in the second derailleur direction corresponds to downward gearshifting.

37. A device according to claim 34, further comprising a connecting rod mounted so that it moves in rotation in the support body about a rotational axis of the connecting rod between a rest position and at least one deviated position, and wherein the single lever is hinged to the connecting rod according to a rotational axis of the single lever, different from the rotational axis of the connecting rod and parallel thereto.

38. A device according to claim 37, further comprising a first elastic member between the connecting rod and the support body, to push the connecting rod into its rest position, and a second elastic member between the single lever and the connecting rod to push the single lever into its rest position.

39. A device according to claim 38, wherein the first elastic member exerts a push on the connecting rod that prevails over the second elastic member, so that a push on the single lever first moves the single lever into the deviated position without moving the connecting rod and then subsequently moves the connecting rod.

40. A device according to claim 34, further comprising a second lever that is mobile with respect to the support body for commanding a brake.

41. A method for controlling a bicycle comprising a braking system and at least one gearshift with a derailleur that moves in each of a first and second derailleur direction of movement, comprising:

actuating a lever in a first direction to command the braking system to obtain braking;

actuating the same lever in a second direction different from the first direction to command the movement of the derailleur in the first derailleur direction; and

actuating the same lever in a third direction different from the first direction to command the movement of the derailleur in the second derailleur direction.

42. A method according to claim 41, wherein the third direction is opposite the second direction.

43. A method according to claim 41, wherein the third direction is the same as the second direction, and wherein the actuation of the lever in the second direction to command the movement of the derailleur the first derailleur direction comprises moving the lever a different distance compared to a movement of the same lever in the same direction to command the movement of the derailleur in the second derailleur direction.

44. A method according to claim 41, wherein the first direction of movement of the lever is substantially perpendicular to each of the second and third directions of movement of the lever.

45. A method according to claim 41, wherein the actuation of the lever in the first direction takes place at the same time as the actuation of the lever in the second and/or third direction.

46. A control device for a bicycle comprising:

a single lever that is mobile with respect to a support body to command both a brake and a derailleur, wherein the single lever:

has a rest position,

moves in a first direction to activate the brake, and

moves in a second direction, by a first distance that moves the derailleur in a first derailleur direction, and by a second distance that moves the derailleur in the second derailleur direction.

47. A Device according to claim 46 further comprising:

a cable-winding bush, supported so that it rotates on the support body, on which bush a derailleur control cable is wound,

an indexing mechanism that comprises a gear wheel supported so that it can move in rotation on the intermediate body about the second rotational axis between a predetermined number of predetermined angular positions corresponding to the desired positions of the derailleur,

a transmission mechanism between the cable-winding bush and the gear wheel of the indexing mechanism, that causes a rotation of the gear wheel to correspond to a rotation of the cable-winding bush.

48. A device according to claim 47, wherein the transmission mechanism comprises a sliding connection that allows substantially linear movement of said indexing mechanism with respect to said cable-winding bush.

49. A control device for controlling a bicycle derailleur, comprising a support body configured to be fixed to a handlebar of a bicycle, and a lever that moves with respect to the support body to activate both a brake and a derailleur;

wherein to activate the brake requires one movement of the lever in a first direction, and activation of the derailleur requires movement of the lever in a second direction;

wherein movement of the derailleur occurs in substantially two opposite derailleur directions, and movement in each of these derailleur directions is controlled by movement of the lever in the second direction;

wherein the movement of the lever by a distance in the first direction moves the derailleur in a first derailleur direction, and movement of the lever by a further distance in the first direction moves the derailleur in a substantially opposite derailleur direction to the first derailleur direction.

50. A control device for controlling a bicycle derailleur, comprising a support body configured to be fixed to a handlebar of a bicycle, and a lever that moves with respect to the support body to both activate a brake and cause a gearshift;

wherein activating the brake requires one movement of the lever in a first direction, and causing the gearshift requires movement of the lever in a second direction;

wherein the gearshift can be an upwards gearshift or downwards gearshift, depending on movement of the lever in the second direction.