Title: ROLLER BLADE SHOES

Abstract: Disclosed is a roller blade shoe which has a shoe body having a cavity in an outsole thereof. A housing is accommodated in the cavity of the shoe body and an underside of the housing is opened. A plurality of roller assemblies are collapsibly installed lengthwise of the housing in an in-line pattern. Each roller assembly includes a lever fork having an upper end pivotably supported on a sidewall of the housing and a roller installed at a lower end of the lever fork. A manipulating handle is pivotably installed at the shoe body and rotated in a forward or backward direction to accommodate/withdraw the roller assemblies into/from the housing. A roller driving wire includes a withdrawing wire and an accommodating wire which are arranged in parallel to each other and both ends of which are connected to the roller assembly. A roller locking device is cooperated with the roller driving wire. A brake is mounted on a rear end of the outsole of the shoe body.
ROLLER BLADE SHOES

Technical Field

The present invention relates to roller blade shoes, and more particularly, to a shoe in which a roller blade assembly is integrally accommodated in an outsole of a shoe body in such a manner that a user can use the roller blade or inline skate by withdrawing rollers of the roller assembly from the outsole of the shoe as needed, while wearing the shoe as ordinary shoes in ordinary times.

Background Arts

A roller blade, which is called a inline skate, has a plurality of rollers arranged in an outsole of a boot in an in-line pattern. Together with roller skates, the roller blades or inline skates are widely used as leisure equipment to freely play on a paved road. Because of the structural characteristic of the roller blade, the user playing the roller blade or inline skate can enjoy more speedy action while posing a precise motion than a conventional roller skate so that the roller blade is widely spread in the world.

In a conventional roller blade, a plurality of rollers are fixedly arranged in an outsole of a boot in an in-line pattern. However, since the roller blade is usually used in a rigid ground, such as asphalt or a concrete ground, the user is required to move to the proper place for enjoying the roller blade with wearing ordinary shoes, while separately carrying the roller blade. Then, the user takes off the ordinary shoes and wears the roller blade. In addition, since the user takes a daily life with wearing the ordinary shoes, if the user wants to enjoy the roller blade in the outdoor, the
user has to separately carry the roller blade.

Therefore, the user alternately wears the ordinary shoes and the in-line skate depending on the place and the conditions of the user and separately purchases the ordinary shoes and the roller blade, which are very cumbersome for the user.

**Disclosure of the Invention**

The present invention has been made to solve the above problems of the prior art, therefore, the first object of the present invention is to provide a shoe with roller blade assembly which can be used as both roller blade or inline skate and shoes by accommodating a roller blade assembly in an outsole of a shoe such that the roller blade assembly can be withdrawn from the outsole of the shoe as needed, while wearing the roller blade as ordinary shoes in ordinary times.

The second object of the present invention is to provide a shoe with roller blade assembly, which allows a user to conveniently enjoy the roller blade or inline skate as necessary, without separately purchasing the shoes and the roller blade or inline skate.

The third object of the present invention is to provide a shoe with roller blade assembly, which allows a user to properly reduce the speed and to be stably stopped while playing the roller blade or inline skate.

To achieve the objects of the present invention, there is provided a shoe with roller blade assembly comprising: a housing being accommodated in a cavity formed in an outsole of a shoe body and having an underside being opened; a plurality of roller assemblies collapsibly installed lengthwise of the housing in an in-line pattern, each roller assembly including a lever fork having an upper end pivotably supported on a side wall of the housing and a roller installed at a lower
end of the lever fork; a manipulating handle pivotally installed at a heel of the shoe body and rotated in a forward direction or a backward direction to accommodate/withdraw the roller assemblies into/from the housing; a roller driving wire including a withdrawing wire and an accommodating wire which are arranged in parallel to each other and both ends of which are connected to the roller assembly and the manipulating handle at a predetermined angle about each pivot section thereof; a roller locking means which is cooperated with the roller driving wire so as to fix the roller assemblies in a withdrawing state; and a brake mounted on a rear end of the outsole of the shoe body for providing a braking force as necessary.

According to the preferred embodiment of the present invention, the roller locking means includes a lever plate formed in the lever fork and having a latching slot at a periphery thereof, a pair of wire guide pins arranged at an upper end of the housing with a predetermined interval in front and rear directions thereof so as to provide a moving route for the withdrawing and accommodating wires; and a locking pin which is supported by a housing between the wire guide pins to make contact with upper portions of the withdrawing and accommodating wires. The locking pin is downwardly biased so as to be inserted into the latching slot when the roller is withdrawn.

According to another embodiment of the present invention, the roller locking means includes a rotating shaft of the lever fork having a latching slot at a periphery thereof, a pair of wire guide pulleys arranged at an upper end of the inner housing with a predetermined interval in front and rear directions thereof so as to provide a moving route for the roller driving wire, and a lock lever having a first end pivotally supported by the housing and a second end elastically biased to make contact with the rotating shaft of the
lever forks such that the lock lever is selectively latched with the latching slot. The lock lever has a contact pin provided at the second end of the lock lever so as to make contact with an upper end of the accommodating wire.

According to still another embodiment of the present invention, the plurality of roller assemblies are divided into a front roller section and a rear roller section which are integrally connected to each other by a connection link. The roller driving wire is connected to one roller assembly of each front and rear roller section.

According to the present invention, a user can wear the shoe with roller assembly as ordinary shoes in ordinary times by accommodating a roller assembly in an outsole of a shoe body and can use the shoe by withdrawing the roller assembly from the outsole of the shoe body as needed. Accordingly, it is not required to separately purchase the shoes and the roller blade or inline skate. In addition, since the shoe can be used as the shoes and the roller blade or inline skate, the functional and economical features of the shoes can be improved as well as the user can conveniently use the roller blade or inline skate.

**Brief Description of the Drawings**

The above objects, and other features and advantages of the present invention will become more apparent by describing preferred embodiments thereof with reference to the attached drawings in which:

FIG. 1 is a bottom perspective view showing a shoe with roller blade assembly according to one embodiment of the present invention;

FIG. 2 is a sectional view showing the assembled state of the shoe shown in FIG. 1;

FIG. 3 is a bottom exploded perspective view of a roller blade
assembly of the shoe shown in FIG. 1;

FIGS. 4 is sectional view showing the assembled state of the roller blade assembly shown in FIG. 3;

FIG. 5 is a sectional view taken along the line V-V of FIG. 4;

FIG. 6 is a side view taken along the arrow VI of FIG. 5;

FIG. 7 is a perspective view of the front part of FIG. 4;

FIG. 8 is a sectional view of a manipulating handle shown in FIG. 2;

FIG. 9 is a side view of FIG. 8;

FIG. 10 is an exploded perspective view of a brake shown in FIG. 1;

FIG. 11 is an assembling view of FIG. 10;

FIG. 12 is a sectional view taken along the line XII-XII of FIG. 11;

FIGS. 13a and 13b are sectional views showing another embodiments of the present invention;

FIG. 14 is a plan view taken by partially cut FIG. 13;

FIG. 15 is a perspective view of the front part of FIG. 13b;

FIG. 16 is an exploded perspective view of a manipulating handle shown in FIG. 13;

FIG. 17 is an assembled sectional view of FIG. 16;

FIG. 18 is a side view of FIG. 17;

FIG. 19 is an exploded perspective view of a locking device shown in FIG. 13;

FIGS. 20a and 20b are sectional views showing operational states of the locking device;

FIG. 21 is an exploded perspective view of a brake shown in FIG. 13;

and

FIG. 22 is an assembled sectional view of FIG. 21.
Best Mode for Carrying Out the Invention

Hereinafter, preferred embodiments of the present invention will be described with reference to the accompanying drawings.

Referring to FIGS. 1 and 2, a shoe with roller blade assembly according to the present invention has a shoe body S having an outsole B formed with a cavity C. An underside of the cavity C is opened. A roller blade assembly 1 is operatively accommodated in the cavity C. For this reason, the outsole B of the present invention is formed thicker than an outsole of a traditional shoe.

As is detailedly shown in FIGS. 3 to 6, the roller blade assembly 1 has a rectangular housing 10 which is accommodated in the cavity C of the outsole B to act as a base frame, roller assemblies 20 which are accommodated in the housing 10 in an in-line pattern and selectively withdrawn therefrom, a manipulating handle 30 for selectively accommodating/withdrawing the roller assemblies 20 into/from the housing 10, a roller driving wire 40 for connecting the roller assemblies 20 to the manipulating handle 30 such that each roller assembly 20 can reversibly perform a leverage movement in forward and backward directions, a locking device 50 for fixing the roller assemblies 20 in their withdrawing position, and a brake 60 for decelerating the speed or stopping the roller blade or in-line skate during playing the roller blade or in-line skate.

Though the housing 10 can be formed in a single body, it is preferred that the housing 10 includes an outer housing 11 accommodated in the cavity of the outsole B and an inner housing 12 detachably assembled in the outer housing 11 for easily repair the roller blade assembly 1 when the roller blade assembly 1 has a fault. The inner housing 12 is securely assembled in the outer housing 11 with sufficient coupling force. In order
to securely assemble the inner housing 12 in the outer housing 11, for example, a plurality of coupling holes H are formed at both sides of the outsole B as shown in FIG. 1. Then, the inner housing 12 is coupled to the outer housing 11 by means of screws 13, at the same time, upper plates of the outer and inner housings 11 and 12 are coupled to each other by means of screws 13.

The outer housing 11 can be integrally accommodated in the cavity C of the outsole B by using urethane foam, or can be integrally manufactured with the outsole B by performing an insert molding process. Preferably, a heel cover 14 is integrally formed with an upper rear end of the outer housing 11 as a reinforcing member for mounting the manipulating handle 30.

A plurality of hinge holes 15 are coaxially formed at both sides of longitudinal sidewalls of the inner housing 12 with a predetermined interval so as to mount roller assemblies 20. In addition, a plurality of permission holes 16 are formed in the upper surface of the inner housing 12 for allowing a part of a roller 25 to pass through the permission holes 16 when the roller assemblies 20 are accommodated in the inner housing 12. By forming the permission holes 16, the space formed in the inner housing 12 for receiving the roller assembly 20 can be reduced by a thickness of the inner housing 12, so it is possible to reduce the height of the outsole B. In addition, at front and rear portions of the upper surface of the inner housing 12, there are formed wire withdrawing slots 17a and 17b through which the roller driving wire 40 passes. In addition, a pair of wire guiding slots 18a and 18b are formed between the wire withdrawing slots 17a and 17b so as to guide the withdrawing and accommodating wires 41 and 42 of the roller driving wire 40. A stopper 19 is provided at front and rear inner portions of
the inner housing 12. The stopper 19 limits the withdrawing degree of the roller assemblies 20 and supports the withdrawn roller assemblies 20.

Each roller assembly 20 includes a lever fork 21 having a substantially "匂" shape and an upper middle thereof is pivotably coupled to longitudinal sidewalls of the inner housing 10, and a roller 25 rotatably mounted at a lower end of the lever fork 21 by a shaft 25a. The lever fork 21 has a pair of lever plates 22 and 23 which are arranged in opposite to each other with a predetermined interval and are supported in hinge holes 15 opposed to the inner housing 12 by rivets 24. Lever plates 22 and 23 respectively have spools 22a and 23a at side portions thereof. The spools 22a and 23a guide the withdrawing and accommodating wires 41 and 42 by winding end portions of the withdrawing and accommodating wires 41 and 42 to allow the withdrawing and accommodating wires 41 and 42 of the roller driving wire 40 to easily operate.

On the other hand, in order to permit the roller assemblies 20 to be accommodated/withdrawn into/from the housing 10 by performing a rotating action, a space corresponding to the rotational radius of the roller assembly 20 is formed in the housing 10. For this reason, the roller assemblies 20 are divided into a front roller section 26 and a rear roller section 27 which are rotatably moved in opposite to each other and are respectively arranged at front and rear portions of the housing 10 while forming an interval therebetween for the rotating action of the roller assemblies 20. The front roller section 26 and the rear roller section 27 are integrally connected by a connection link 28, which is commonly coupled to shaft 25a of the roller 25. Therefore, only one roller assembly 20 of front roller section 26 and one roller assembly 20 of the rear roller section 27 are connected the roller driving wire 40. Preferably, a pivot section of the lever
forks 21 of foremost and rearmost roller assemblies 20 connected to the roller driving wire 40 is formed in a circular type.

For example, when the roller blade assembly 1 has four roller assemblies 20, the number of the roller assemblies 20 in the front and rear roller sections is in a ratio of 1:3, 2:2 or 3:1. However, since the weight of a user is biased in the front direction when playing the roller blade assembly 1, it is preferred that three roller assemblies 20 are arranged in the front roller section 26 and one roller assembly 20 is arranged in the rear roller section 27.

The roller assembly 20 is withdrawn from the housing 10 while performing the rotating action. For this reason, in order to maintain the stable running condition, it is preferred that a vertical line connecting rotational centers of the roller assembly 20 and the roller 25 of the roller assembly 20 passes through a perpendicular line extended from a rotational center of the lever fork 21 while forming a predetermined angle therebetween when the roller is withdrawn. The stopper 19, which limits the withdrawing degree of the roller assembly 20 and supports the withdrawn roller assembly 20, is positioned at an outer portion of the perpendicular line, which passes through the rotational center of the lever fork 21.

As detailedly shown in FIGS. 8 and 9, the manipulating handle 30 includes a body 31 pivotally coupled to a heel of the shoe body 5 and having a spool 32 around with the roller driving wire 40 is wound, and a handle 33 protruded from the body 31 for rotationally manipulating the body 31. The spool 32 is provided with a wire fixing pin 34 for fixing withdrawing and accommodating wires 41 and 42 of the roller driving wire 40. Only one wire fixing pin 34 is provided to simultaneously fixing the withdrawing and accommodating wires 41 and 42 by winding the
withdrawing and accommodating wires 41 and 42 around the spool 32 in opposite directions. However, it is also possible to provide two wire fixing pins 34 having a predetermined angle therebetween for separately fixing the withdrawing and accommodating wires 41 and 42. The body 31 is formed at one side thereof with a pair of fixing slots 35a and 35b, which are spaced at a predetermined angle about the pivot section corresponding to the withdrawing and accommodating positions of the roller assembly 20. A locker 36, which is alternately inserted into fixing slots 35a and 36b of the manipulating handle 30 for fixing the manipulating handle 30 in the withdrawing and accommodating positions of the roller assembly 20, is installed at the heel of the shoe body S. The locker 36 is elastically biased towards the body 31 by a spring 37. As shown in the figures, the locker 36 includes a ball or pin (not shown).

The roller driving wire 40 includes the withdrawing wire 41 and the accommodating wire 42 which are arranged in parallel to each other and both ends of which are parallelly connected to the lever fork 21 and the manipulating handle 30 of the roller assembly 20. The withdrawing wire 41 is fixed to both lever plate 22 of the lever fork 21 and a fixing pin 34a of the manipulating handle 30, and the accommodating wire 42 is fixed to the lever plate 23 of the lever fork 21 and a fixing pin 34b of the manipulating handle 30. Thus, the withdrawing and accommodating wires 41 and 42 can accommodate and withdraw front and rear rollers 21 and 25 by simultaneously and continuously performing a relative interaction such as pulling and pushing actions.

Plural roller driving wires 40 can be provided for separately driving each roller assembly 20. However, since the roller assemblies 20 are grouped as the front roller section 26 and the rear roller section 27 and
integraly connected with other, the withdrawing and accommodating wires 41 and 42 respectively have two branch wires 41a, 41b, 42a and 42b, which are integraly formed with the withdrawing and accommodating wires 41 and 42. Accordingly, front side branch wires 41a and 42a of each withdrawing and accommodating wire 41 and 42 are fixed to lever plates 22 and 23 of the front roller section 26 through a wire withdrawing slot 17a along a wire guiding slot 14 corresponding to the inner housing 12. In addition, rear side branch wires 41b and 42b of each withdrawing and accommodating wire 41 and 42 are fixed to lever plates 22 and 23 of the rear roller section 27 through a wire withdrawing slot 17b formed at a rear portion of the inner housing 12.

The locking device 50 includes a pair of wire guide pins 51 and 52 which provide a zigzag type moving route for front and rear branch wires 41a, 42a, 41b and 42b, a locking pin 54 which is cooperated with the withdrawing and accommodating wires 41 and 42 so as to fix the roller assembly in the withdrawing position, and a latching slot 56 formed at a periphery of the lever plate 23 of the lever fork 21 for selectively receiving the locking pin 54.

The pair of wire guide pins 51 and 52 are positioned on the upper portion of the roller assembly 20 connected to the roller driving wire 40 and are installed at the housing 10 with a predetermined interval in the front and rear directions thereof. Guide pulleys 53 are installed at both ends of each pair of wire guide pins 51 and 52. The guide pulleys 53 guide branch wires 41a, 42a, 41b and 41b of the withdrawing and accommodating wires 41 and 42 such that they can be easily moved when the manipulating lever 30 is rotated. The locking pin 54 is positioned between wire guide pins 51 and 52 and installed in the inner housing 12 so as to make contact with the upper portions of the withdrawing and accommodating wires 41 and 42.
One end of the locking pin 54 making contact with the accommodating wire 42 is downwardly biased by the torsion spring 55. Thus, one end of the locking pin 54 making contact with the accommodating wire 42 is movably inserted into an elongated hole 57 which is vertically formed at a sidewall of the inner housing 12 so that the locking pin 54 can act a lever movement in the upper and lower directions thereof about the other end thereof as the roller driving wire 40 operates. The latching slot 56 is formed at a periphery of the pivot section of the lever plate 23 to which the accommodating wire 42 is connected. The latching slot 56 matches with the position of the locking pin 54 when the roller assembly 20 is completely withdrawn.

In addition, though it is not separately illustrated, the latching slot is respectively formed at the pair of lever plates of the lever fork such that a predetermined angle is formed therebetween. In addition, the vertically elongated hole for guiding both ends of the locking pin is respectively formed at both sidewalls of the housing such that both ends of the locking pin can be selectively inserted into the latching slots of the lever plates when the roller is withdrawn or accommodated. Accordingly, the roller can be fixed in the withdrawing or accommodating position. That is, when the roller is withdrawn, one end of the locking pin is lifted by the withdrawing wire, which is tightly stretched. On the contrary, the other end of the locking pin adjacent to the accommodating wire is relatively loosed so that the other end of the locking pin is descended by the elastic force of the spring and is inserted into the latching slot of the corresponding lever plate thereby fixing the roller in the withdrawing state. In addition, when the roller is accommodated, one end of the locking pin inserted into the latching slot of the lever plate in the withdrawing state is released from the
latching slot and is lifted by the accommodating wire, which is tightly stretched. On the contrary, the other end of the locking pin adjacent to the withdrawing wire is relatively loosed so that the other end of the locking pin is inserted into the latching slot of the other lever plate by the elastic force of the spring thereby fixing the roller in the accommodating state.

As detailedly shown in FIGS. 10 to 12, the brake 60 includes a casing 61 having a downwardly opened space section 62 therein and a brake block 67 which is installed in the space section 61 and a part of which is downwardly protruded.

The casing 61 is formed at a side thereof with a fixing hole 61a and is screw-coupled with the heel of the outsole B of the shoe S by a screw 65. Preferably, the screw 65 is screw-coupled with the housing 10 accommodated in the outsole B so as to fixedly maintain the housing 10 with respect to the outsole B. A supporting member 63 is protruded from a front upper portion of the casing 61. The supporting member 63 is inserted into the heel of the shoe body S so as to fixedly support the casing 61 with respect to the outsole B. For this purpose, the supporting member 63 upwardly extends from the casing 61 in an "L" shape and an inserting slot A is formed at the heel of the shoe body S to receive the supporting member 63.

The brake block 67 is simply press-fitted into the space section 62 of the casing 61. Preferably, the brake block 67 is movably accommodated in the space section 62 of the casing 61 as shown in the figures such that a length of the protruding portion thereof can be adjusted when the protruding portion is worn away and is fixed in the space section 62 of the casing 61 by a fixing screw 66 which passes through a side portion of the casing 61.
For this purpose, a supporting wall 64 is integrally formed in the space section 62 of the casing 61 to bisect the space section 62. In addition, a pair of inserting sections 68, which are respectively inserted into the bisected space section 62, are parallelly formed at both upper end portions of the brake block 67. The inserting sections 68 are fixed to the supporting wall 64 by fixing screws 66 provided at both sides of the casing 61 so that the brake block 67 is fixedly mounted in the casing 61. The screw 65 is coupled to the outsole B of the shoe body S by passing through the supporting wall 64 of the casing 61.

Hereinafter, a method for using the shoe with roller blade assembly having the above structure will be described.

Referring to FIG. 2, the roller assemblies 20 of the front and rear roller sections 26 and 27 accommodated in the housing 10 received in the outsole B of the shoe body S are illustrated in a solid line. In this state, the accommodating wire 42 of the roller driving wire 40 is pulled towards the manipulating handle 30 and the withdrawing wire 41 is pulled in a direction opposite to the accommodating wire 42. Accordingly, the roller assemblies 20 are folded into the housing 10 without downwardly protruding out of the outsole B, so the user can freely walk with wearing the in-line skate as ordinary shoes. In the accommodating state of the roller assemblies 20, the user can walk with mounting the brake 60 in the shoe body S. However, it is preferred to separate the brake 60 from the shoe body S for the convenience of walk. At this time, the free end of the locking pin 64 is restrained by making contact with the periphery of the accommodating side lever plate 23 of the roller assembly 20 while being pushed towards the upper portion of the elongated hole 57. In addition, the locker 36 which is elastically inserted into the accommodating side fixing slot 35b stably fixes
the manipulating handle 30. Therefore, the roller assemblies 20 are prevented from unnecessarily protruding out of the outsole B when walking.

In the above state, if the user wants to play the roller blade or in-line skate, the brake 60 is mounted in the heel of the outsole B (except for the brake 60 is already mounted in the heel of the outsole B). In order to mount the brake 60 in the heel of the outsole B, the supporting member 63 of the casing 61 is inserted into the inserting slot A formed at the heel of the shoe body S such that the supporting member 63 is suspended at an inner portion of the heel cover. Then, the screw 65 is screw-coupled to the outsole B through the fixing hole 61a. After mounting the brake 60, as shown in FIG. 11 with a phantom line, the height of the brake block 67 with respect to the ground is properly adjusted by using the fixing screw 66. In this state, if it is required to decelerate the speed or stop the shoe, the user generates a frictional force by making the brake block 67 selectively contact with the ground. On the other hand, if the user uses the roller blade or in-line skate for a long time, the brake block 67 is worn away. In this case, the brake block 67 is further protruded from the casing 61 by using the fixing screw 66. If the brake block 67 cannot be further protruded, only the brake block 67 is replaced with new one.

Then, as shown in FIG. 9, the manipulating handle 40 is rotated counterclockwise at an angle of 180 degrees. As a result, the withdrawing wire 41 is pulled by the rotating action of the manipulating handle 30, at the same time, the accommodating wire 42 is relatively trailed. Accordingly, as shown in FIG. 2 with a phantom line and in FIG. 4B, the roller assemblies 20 of the front and rear roller sections 26 and 27 are rotated in opposite directions about the pivot section of the lever fork 21, so that the
roller assemblies 20 are downwardly protruded out of the outsole B. At this time, the front and rear roller sections 26 and 27 make contact with the stopper 19 of the inner housing 12, so the rotation of the front and rear roller sections 26 and 27 is restrained at a proper withdrawing state. That is, since the withdrawing and accommodating wires 41 and 42 are connected to the front and rear portions of roller assemblies 20 about the pivot point of the lever fork 21 while forming a predetermined angle therebetween, the roller assemblies 20 are rotated in forward or backward direction about the pivot point thereof by the relative pulling and trailing actions of the withdrawing and accommodating wires 41 and 42 caused by the rotating action of the manipulating handle 30.

When the roller assemblies 20 are withdrawn, the latching slots 56 formed in the accommodating side lever plates 23 of the front and rear roller sections 26 and 27 are matched with the positions of the locking pins 54 of the locking device 50. Accordingly, the free end of each locking pin 54 is downwardly moved along the elongated hole 57 of the inner housing 12 by the restoring force of the torsion spring 55 so that the free end of the each locking pine 54 is elastically inserted into the latching slot 56 of the corresponding lever plate 23. That is, when the roller assemblies 20 are withdrawn, the withdrawing wire 41 is tightly maintained and the accommodating wire 42 is trailed so that the accommodating wire 42 is relatively loosed. Accordingly, when the roller assemblies 20 have been withdrawn, the free end of the locking pin 54 restrained by making contact with the periphery of the lever plate 23 is inserted into the latching slot 56 of the lever plate 23 while pushing the accommodating wire 42 by the restoring force of the torsion spring 55. Then, the pair of lever forks 21 of the front and rear roller sections 26 and 27 are fixed to the housing 10 by
the locking pin 54, so the roller assemblies 20 are stably fixed in the withdrawing state. Therefore, when the user plays the in-line skate, the roller assemblies 20 cannot be folded or moved even when the roller 25 is collided with the ground or the external impact is applied to the roller 25.

At the same time, the withdrawing side fixing slot 35a of the manipulating handle 30 is matched with the locker 36 so that the locker 36 is elastically inserted into the withdrawing side fixing slot 35a. Thus, the manipulating handle 30 is fixed in the withdrawing position so that the withdrawn roller assembly 20 is safely fixed in a duplicate manner.

On the other hand, after playing the roller blade or inline skate, if the user rotates the manipulating handle 20 in an opposite direction against the withdrawing of the roller assembly 20, the accommodating wire 42 is tightly pulled and the withdrawing wire 41 is relatively trailed. As the accommodating wire 42 is pulled, the free end of the locking pin 54 inserted into the latching slot 56 of the accommodating side lever plate 23 of the roller assembly 20 is lifted along the elongated hole 57 of the inner housing 12 while compressing the torsion spring 55, so that the free end of the locking pin 54 is released from the latching slot 56. As a result, lever forks 21 of the front and rear roller sections 26 and 27 are folded by simultaneously rotating in the opposite direction against the withdrawing of the roller assembly 20 so that the roller 25 is accommodated in the housing 10.

At this time, the free end of the locking pin 54 released from the latching slot 56 makes contact with the periphery of the lever plate so that the descend of the free end of the locking pin 54 is restrained. In addition, the accommodating side fixing slot 35b of the manipulating handle 30 is again matched with the locker 36 so that the manipulating handle 30 is
fixed in the accommodating position by the locker 36. Therefore, the roller blade or inline skate can be used as ordinary shoes. In this state, the brake 60 can be mounted in the shoe body S or can be separated from the shoe body S.

FIGS. 13 to 15 show a shoe with roller blade assembly according to another embodiment of the present invention. As same as the above described embodiment, a roller blade assembly 1' of the present embodiment has a housing 10 which is accommodated in the cavity C of the outsole B, roller assemblies 20 which are accommodated in the housing 10 in an in-line pattern and selectively withdrawn therefrom, a manipulating handle 70 for selectively accommodating/withdrawing the roller assemblies 20 into/from the housing 10, a roller driving wire 40 for connecting the roller assemblies 20 to the manipulating handle 70 such that each roller assembly 20 can reversibly perform a leverage movement in forward and backward directions according to the operation of the manipulating handle 70, a locking device 80 for fixing the roller assemblies 20 in their withdrawing position, and a brake 90 for decelerating the speed or stopping the roller blade or in-line skate during playing the roller blade or in-line skate. The present embodiment has the structure similar to the structure of the above-mentioned embodiment except for the manipulating handle 70, the locking device 80 and the brake 90. The same reference numbers are used to refer the same elements for the convenience, and only different parts will be described below.

As shown in FIGS. 16 to 18, the manipulating handle 70 includes a base 71 fixed to the heel of the shoe body S, a disc rotatably assembled with the base 71 and connected to one end of the roller driving wire 40, a knob 76 for rotating the disc 74, and a locker 78 for fixing the disc 74 in the withdrawing or accommodating
position of the roller assemblies 20.

The base 71 is screw-coupled to a heel cover 14 of the housing by a screw 71a. Accordingly, the bottom of the base 71 is preferably formed as an arc shape having a proper curvature for uniformly making contact with the heel cover 14. An operating slot 72 is formed at the bottom of the base 71 for receiving the disc 74. A pair of wire passages 73 are formed at a lower portion of the base 71 in parallel to each other for allowing the end portions of the withdrawing and accommodating wires 41 and 42 to be introduced into the operating slot 72. The disc 74 has a pulley shape formed at a periphery thereof with a groove such that end portions of the withdrawing and accommodating wires 41 and 42 are wound around the periphery of the disc 74. In addition, the disc 74 is provided at a center of one side thereof with a coupling shaft 75 which is protruded passing through the base 71. A wire fixing pin 74a for fixing the withdrawing and accommodating wires 41 and 42 of the roller driving wire 40 is provided at the periphery of the disc 74. The knob 76 has a disc shape and is fixed to the coupling shaft 75 of the disc 74, which is protruded passing through the base 71, by a pin 77. The locker 78 is selectively inserted into a pair of fixing slots 76a and 76b formed at the bottom of the knob 76. The pair of fixing slots 76a and 76b are spaced with forming a predetermined angle therebetween about the pivot section thereof such that the fixing slots 76a and 76b are matched with the withdrawing and accommodating positions of the roller assembly 20. The locker 78 is accommodated in a proper position of the base 71 and a part of the locker 78 is protruded to the exterior by the elastic force of the spring 79.

As detailedly shown in FIGS. 19 to 20b, the locking device 80 includes pairs of guide pulleys 81 and 82 for forming a moving route for
the front and rear branch wires 41a, 42a, 41b and 42b of the withdrawing and accommodating wires 41 and 42, a lock lever 84 which is cooperated with the roller driving wire 40 for fixing the roller assembly 20 in the withdrawing state, and a latching recess 86 which is formed at a periphery of a rotating shaft 21a of the lever fork 21 to selectively receive the lock lever 84.

Pairs of wire guide pulleys 81 and 82 are positioned at the upper portions of the roller assemblies 20 connected to the roller driving wire 40 and are installed in the housing 10 with a predetermined interval in the front and rear directions thereof. On end of the lock lever 84 is rotatably coupled to a supporting shaft 83 of the outer wire guide pulleys 81 and 82, and the other end of the lock lever 84 is downwardly biased by the torsion spring 89. The lock lever 84 is formed at a bottom thereof with a stopping protrusion 85, which is selectively latched into the latching recess 86 of the rotating shaft 21a of the lever fork when the roller assembly 20 is withdrawn. In addition, a contact pin 87 for elastically making contact with the accommodating wire 42 is provided at both sides or one side of the other end of the lock lever 84. Preferably, a pulley 87a is mounted on the contact pin 87 for stably operating the lock lever 84 by guiding the movement of the accommodating wire 42. In addition, since the latching recess 86 is formed at the rotating shaft 21a of the lever fork 21, the rotating shaft 21a of the lever fork 21 of the roller assembly 20 connected to the roller driving wire 40 has a diameter relatively larger than a diameter of the rotating shaft of the other lever fork 21. For this reason, a notch 88 is formed at the periphery of the rotating shaft 21a of the lever fork 20 of the roller assembly 20 connected to the roller driving wire 40 to allow a part of the roller to be introduced into the rotating shaft 21a.
As detailedly shown in FIGS. 21 and 22, the brake 90 includes a body 91 coupled to the rear roller section 27 which is withdrawn from the outsole B of the shoe body S and a brake pad 94 attached to an underside of the body 91. The body 91 has a pair of hooks 92 and 93 at a front end thereof. The hooks 92 and 93 are parallely arranged to each other and coupled to a shaft 25a of the rear roller section 27. A support 95 having a predetermined length is provided at one side of the body 91. The support 95 upwardly and vertically extends from the body 91 and makes contact with an inner portion of the inner housing 12. The brake pad 94 is fixed to the body 91 by a screw 96 and is replaced with new one when it is worn away.

The user separately carries the brake 90 and selectively adopts the brake 90 in the shoe when the user wants to play the roller blade or inline skate. In order to mount the brake 90 in the roller blade or inline skate, the roller assembly 20 is withdrawn from the housing 10 by a half. Then, the pair of hooks 92 and 93 are coupled to the shaft 25a of the rear roller section 27. After that, the roller assembly 20 is completely withdrawn from the housing 10, at the same time, the support 95 is introduced into the inner housing 12. Thus, the hooks 92 and 93 and the support 95 are supported by the shaft 25a of the roller 25 and the rear inner wall of the inner housing 12, so that the brake 90 is fixedly mounted in the in-line skate. When the roller assembly 20 is accommodated in the housing 10 after playing the roller blade or inline skate, the brake 90 is separated from the roller blade or inline skate.

According to the present embodiment, the roller assemblies 20 are folded and accommodated in the outsole B when the user walks with wearing the she as ordinary shoes. In this state, if the user wants to play the roller blade or inline skate, the roller assembly 20 is withdrawn from the
outsole B.

That is, if the user rotates the knob 76 of the manipulating handle 70 in the withdrawing direction, the disc 74 accommodated in the operating slot 72 of the base 71 is simultaneously rotated, so that the withdrawing wire 41 is tightly pulled and the accommodating wire 42 is relatively trailed. Therefore, as shown in FIG. 13b, the front and rear roller sections 26 and 27 are rotated in opposite directions to each other so that the front and rear roller sections 26 and 27 are downwardly protruded out of the outsole B. When the roller assemblies 20 are withdrawn, the latching recess 86 formed in the rotating shaft 21a of the front and rear roller sections 26 and 27 is matched with the stopping protrusion 85 of the lock lever 84. Accordingly, the free end of the lock lever 84 is downwardly moved by the restoring force of the torsion spring 89 so that the stopping protrusion 85 thereof is elastically inserted into the latching recess 86 of the rotating shaft 21a of the lever fork 21. Thus, the lever forks 21 of the front and rear roller sections 26 and 27 are fixedly positioned in the housing 10 by the lock lever 84, so the roller assemblies 20 are stably fixed in the withdrawing state. Therefore, when the user plays the in-line skate, the roller assemblies 20 are prevented from being folded or moved event when the roller 25 is collided with the grounded or the external impact is applied to the roller 25. At this time, the withdrawing side fixing slot 76a of the manipulating handle 70 is matched with the locker 78, so the locker 78 is elastically inserted into the fixing slot 76a, thereby fixing the manipulating handle 70 in the withdrawing position.

After enjoying the roller blade or inline skate, the knob 76 of the manipulating handle 70 is rotated opposite to the withdrawing direction of the roller assembly 20. Then, the disc 74 is rotated in the accommodating
direction of the roller assembly 20, so that the accommodating wire 42 is tightly pulled and the withdrawing wire 41 is relatively trailed. As a result, the accommodating wire 42 lifts the contact pin 87 of the lock lever 84 so that the free end of the lock lever 84 is rotatably moved in the upward direction while compressing the torsion spring 89. Accordingly, the stopping protrusion 85 inserted into the latching recess 86 of the rotating shaft 25a of the roller assembly 20 is released from the latching recess 86. Thus, the front and rear roller assemblies 26 and 27 are folded by simultaneously rotating in the directions opposite to the withdrawing direction, so that the roller 25 is accommodated in the housing 10.

At this time, the stopping protrusion 85 of the lock lever 84 released from the latching recess 86 makes contact with the periphery of the rotating shaft 25a of the lever fork 21, so the stopping protrusion 85 is prevented from descending. In addition, the accommodating side fixing slot 76b of the manipulating handle 70 is matched with the locker 78 so that the manipulating handle 70 is fixed in the accommodating position by the locker 78. Therefore, the user can use the roller blade or inline skate as ordinary shoes.

On the other hand, both manipulating handles 30 and 70 and both brakes 60 and 90 are commonly used in the above-described embodiments.

**Industrial Applicability**

As mentioned above, according to the present invention, the shoe is collapsibly mounted such that the roller blade can be accommodated in the outsole of the shoe, so the user can wear the shoe as ordinary shoes and enjoy the roller blade by withdrawing the roller blade from the outsole of the shoe body, as needed. Therefore, it is not required to separately
purchase the shoes and the roller blade or to separately carry the roller blade or inline skate to enjoy the roller blade in the outdoor. In addition, it is not necessary for the user to replace the shoes with the shoe or vice versa according to the condition of the place.

In addition, since the roller blade assembly can be disassembled from the outsole of the shoe body, not only the repairing work for the shoe is simply carried out, but also it is possible to replace the roller blade assembly with new one without wasting the shoe.

Therefore, the present invention can improve functional and economical features of the shoes as well as the user can conveniently use the in-line skate.
Claims

1. A shoe with roller blade assembly comprising:
   a housing being accommodated in a cavity formed in an outsole of a
   shoe body and having an underside being opened;
   a plurality of roller assemblies collapsibly installed lengthwise of the
   housing in an in-line pattern, each roller assembly including a lever fork
   having an upper end pivotably supported on a side wall of the housing and a
   roller installed at a lower end of the lever fork;
   a manipulating handle pivotably installed at a heel of the shoe body
   and rotated in a forward direction or a backward direction to
   accommodate/withdraw the roller assemblies into/from the housing;
   a roller driving wire including a withdrawing wire and an
   accommodating wire which are arranged in parallel to each other and both
   ends of which are connected to the roller assembly and the manipulating
   handle at a predetermined angle about each pivot section thereof;
   a roller locking means which is cooperated with the roller driving
   wire so as to fix the roller assemblies in a withdrawing state; and
   a brake mounted on a rear end of the outsole of the shoe body for
   providing a braking force as necessary.

2. The shoe as claimed in claim 1, wherein the housing includes an
   outer housing accommodated in the outsole of the shoe body and an inner
   housing detachably assembled with the outer housing.

3. The shoe as claimed in claim 1, wherein the plurality of roller
   assemblies are divided into a front roller section and a rear roller section
which are integrally connected by a connection link, and the roller driving wire is connected to one roller assembly of each front and rear roller section.

4. The shoe as claimed in claim 3, wherein the withdrawing and accommodating wires respectively have a pair of branch wires which are branched at first ends of the withdrawing and accommodating wires so as to be connected to the front and rear roller section, respectively.

5. The shoe as claimed in claim 1, wherein the withdrawing and accommodating wires are separately connected to two lever plate of the lever fork, and a pair of guide slots for guiding a movement of the withdrawing and accommodating wires are formed at both sides of the housing.

6. The shoe as claimed in claim 5, wherein the pair of lever plates have a spool for winding the withdrawing and accommodating wires.

7. The shoe as claimed in claim 1, wherein the roller locking means includes;
   a lever plate formed in the lever fork and having a latching slot at a periphery thereof;
   a pair of wire guide pins arranged at an upper end of the housing with a predetermined interval in front and rear directions thereof so as to provide a moving route for the withdrawing and accommodating wires; and
   a locking pin which is supported by a housing between the wire guide pins to make contact with upper portions of the withdrawing and
accommodating wires, the locking pin being downwardly biased so as to be inserted into the latching slot when the roller is withdrawn.

8. The shoe as claimed in claim 7, wherein the latching slot is formed in the lever plate connected to the accommodating wire, and one end of the locking pin connected to the accommodating wire is downwardly biased so as to perform a leverage movement in a vertical direction according to an operation of the roller driving wire.

9. The shoe as claimed in claims 7, wherein a guide pulley for guiding a movement of the withdrawing and accommodating wires is respectively provided at both ends of the wire guide pins.

10. The shoe as claimed in claim 1, wherein the roller locking means includes;

a rotating shaft of the lever fork having a latching recess at a periphery thereof;

a pair of wire guide pulleys arranged at an upper end of the housing with a predetermined interval in front and rear directions thereof so as to provide a moving route for the roller driving wire;

a lock lever having a first end pivotably supported by the housing and a second end elastically biased to make contact with the rotating shaft of the lever fork such that the lock lever is latched with the latching recess when the roller is withdrawn; and

a contact pin provided at the second end of the lock lever so as to make contact with an upper end of the accommodating wire.
11. The shoe as claimed in claim 10, wherein a notch is formed at a periphery of the rotating shaft of the lever fork to allow a part of the roller to be introduced into the rotating shaft.

12. The shoe as claimed in claim 1, wherein the manipulating handle includes;
   a spool formed at a bottom thereof with a pair of latching slots which are positioned corresponding to accommodating and withdrawing positions of the roller assembly, the spool being pivotably supported on a heel of the shoe body, the accommodating and withdrawing wires being wound around the spool in an opposite direction to each other;
   a handle for rotating the spool; and
   a locker mounted in the heel of the shoe body so as to be elastically inserted into one of latching slots of the spool.

13. The shoe as claimed in claim 1, wherein the manipulating handle includes;
   a base fixed to the heel of the shoe body and formed at a bottom thereof with an operating slot and a pair of wire passages for guiding first ends of the withdrawing and accommodating wires towards the operating slot;
   a pulley-shaped disc rotatably accommodated in the operating slot of the base, first ends of the withdrawing and accommodating wires being fixed to the pulley-shaped disc;
   a knob coupled to the pulley-shaped disc and formed at a bottom thereof with a pair of latching slots which are positioned corresponding to accommodating and withdrawing positions of the roller assembly; and
a locker installed on the base so as to be elastically inserted into one of latching slots of the knob.

14. The shoe as claimed in claim 1, wherein the brake includes;

5 a casing coupled to the heel of the outsole of the shoe body and having a space section therein;

a brake block installed in the space section of the casing such that the brake block is moved up and down in the space section, a part of the brake block being downwardly protruded so as to selectively make contact with a ground; and

10 a fixing screw for fixing the brake block to the casing.

15. The shoe as claimed in claim 14, wherein a supporting wall for bisecting the space section is formed in the casing, a pair of inserting sections, which are respectively inserted into both space sections divided by the supporting wall, are formed in the brake block, and the pair of inserting sections of the brake block are fixed at both sides of the casing with respect to the supporting wall by means of the fixing screw.

16. The shoe as claimed in claim 14, wherein a supporting piece having an angle shape is provided on an upper end of the casing, the supporting piece being inserted into a latching slot formed in a heel cover of the shoe body.

17. The shoe as claimed in claim 1, wherein the brake includes;

25 a body having a pair of hooks at a front end thereof, the hooks being coupled to a rotating shaft of a rearmost roller withdrawn from the outsole
of the shoe body;
    a support upwardly extending form the body to make contact with an
inner portion of the housing; and
    a brake pad detachably assembled with an underside of the body.

18. The shoe as claimed in claim 1, wherein a vertical line connecting
rotational centers of the lever fork and the roller of the roller assembly
passes through a perpendicular line extended from a rotational center of the
lever fork while forming a predetermined angle therebetween when the
roller is withdrawn.
A. CLASSIFICATION OF SUBJECT MATTER

IPC7 A43B 3/00, A63C 17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 A43, A63C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KR, JP: IPC as above

Electronic database consulted during the international search (name of database and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search

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Authorized officer

LIM, Ho Soon

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