

REINFORCED FOOTWEAR

FIELD OF INVENTION

5 The present invention relates to reinforced footwear. More particularly, the invention relates to reinforced footwear having an external protecting member and an internal protecting member to protect and strengthen the toe region of the footwear which is most subject to wear and loss of shape.

10 BACKGROUND OF THE INVENTION

Many industries now require their employees to wear shoe such as safety boots to protect their feet against injury caused by impact from above by falling objects or crushing by a vehicle wheel rolling over the foot. Almost all safety shoes currently
15 available comprise a toe protector to provide a protective tool above the toes through which any impact or crushing force applied to its top surface would be transmitted to the insole on which it rests, and through the insole to the outsole and the ground.

U.S. Patent No. 4,870,762 discloses a safety shoe structure including a protective cap
20 mounted above the toe receiving portion of the shoe and between the upper layer and the lining, in which the protective cap has a forward edge formed with a horizontal and inwardly extending lateral flange and a rear edge extended and engaged with a soft piece, while the sole is provided thereon with a generally U-shaped hard piece located at the forward end of the sole upon which the lateral flange rests and a sponge
25 member covers the remaining portion of the sole, and an insole is provided onto the lateral flange and the sponge member.

However, the structure of toe portion in the above US Patent is not strong enough to receive the impacts of various type of objects. Furthermore, the conventional shoe
30 facing the problem of disengagement of the sole at toe portion of the shoe caused by

the wearer tipping over and fall on sharp objects. The disengagement of the sole at the toe portion of the shoe further poses a threat for those working in a chemical environment where the liquid chemical may seep through the opening from the disengagement.

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Therefore, there is a need for a combination of toe protectors for the shoe having an external protecting member and an internal protecting member to protect and strengthen the toe region of the shoe which is most subject to wear and loss of shape.

10 SUMMARY OF INVENTION

According to the invention, reinforced footwear comprises a first protecting member externally mounted on outer surface of the upper of the footwear at toe region thereof; a second protecting member internally mounted on inner surface of the upper of the footwear at toe region thereof; and at least one fastening means for securing the first and second protecting members at the toe region of the footwear.

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Preferably, the first and second protecting members each have an inwardly turned flange extending from the bottom edges of the protecting members.

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The first protecting member preferably has a combination of inwardly and outwardly turned flanges extending from the bottom edges of the first protecting member.

The first protecting member preferably further comprises an downwardly turned front lip extending from the outwardly turned flange.

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The first protecting member preferably further comprises an inwardly turned bottom base extending from the downwardly turned front lip.

The present preferred embodiments of the invention consists of novel features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings and particularly pointed out in the appended claims; it being understood that various changes in the details may be effected by those skilled in the arts but without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

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BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects and advantages of the present invention will be more fully understood when considered with respect to the following detailed descriptions, appended claims and accompanying drawings wherein:

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Figure 1 is a perspective view of reinforced footwear in accordance with the present invention, showing a first and a second protecting members mounted on outer surface and inner surface of the upper of the footwear respectively;

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Figure 2 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first and second protecting members each have an inwardly turned flange;

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Figure 3 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1 showing the first and second protecting members each have an outwardly turned flange;

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Figure 4 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly turned flange and the second protecting member has an inwardly turned flange;

- 5 Figure 5 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly turned flange and downwardly turned front lip, and the second protecting member has an outwardly turned flange;
- 10 Figure 6 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly turned flange, downwardly turned front lip, and inwardly turned bottom base, and the second protecting member has an outwardly turned flange;
- 15 Figure 7 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly turned flange and downwardly turned front lip, and the second protecting member has an inwardly turned flange;
- 20 Figure 8 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly turned flange, downwardly turned front lip, and inwardly turned bottom base, and the second protecting member has an inwardly turned flange;
- 25 Figure 9 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 8 further comprises a third fastening means;

- Figure 10 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly
- 30 and inwardly turned flanges, and the second protecting member has an outwardly

turned flange;

Figure 11 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly
5 and inwardly turned flanges, downwardly turned front lip and the second protecting member has an inwardly turned flange;

Figure 12 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 1, showing the first protecting member has an outwardly
10 and inwardly turned flanges, downwardly turned front lip, and inwardly turned bottom base, and the second protecting member has an inwardly turned flange;

Figure 13 is a lengthwise sectional view of one embodiment of the reinforced footwear shown in Figure 2 further comprises a third protecting member at the heel
15 region of the footwear;

Figure 14 is an enlarged perspective view showing a protecting member of the reinforced footwear has an inwardly turned flange;

20 Figure 15 is an enlarged perspective view showing a protecting member of the reinforced footwear has an outwardly turned flange;

Figure 16 is an enlarged perspective view showing a protecting member of the reinforced footwear has an outwardly turned flange and downwardly turned front lip;
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Figure 17 is an enlarged perspective view showing a protecting member of the reinforced footwear has an outwardly turned flange, downwardly turned front lip and inwardly turned bottom base;

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Figure 18 is an enlarged perspective view showing a protecting member of the reinforced footwear has a combination of outwardly and inwardly turned flanges;

Figure 19 is an enlarged perspective view showing a protecting member of the reinforced footwear has a combination of outwardly and inwardly turned flanges and
5 downwardly turned front lip; and

Figure 20 is an enlarged perspective view showing a protecting member of the reinforced footwear has a combination of outwardly and inwardly turned flanges,
10 downwardly turned front lip, and inwardly turned bottom base.

DETAILED DESCRIPTION OF THE INVENTION

Although for convenience the safety footwear shown in the drawings and described
15 below is a safety boot, the invention is applicable equally to safety shoes, and both types of safety footwear are within the scope of the language of the claims. Footwear usually comprise an upper attached to a composite sole structure comprising as a minimum an insole and an outsole; other structural elements such as a midsole and, in the case of safety footwear a metal plate protecting against penetration by nails and
20 similar sharp objects, may be interposed between the insole and outsole. For convenience in the language used in the claims any such composite sole structure is referred to simply as the footwear sole whatever its actual structure.

Referring to Figure 1, there is shown, are reinforced footwear (10) comprises a first
25 protecting member (1) externally mounted on outer surface of the upper (21) of the footwear (10) at toe region thereof and a second protecting member (3) internally mounted on inner surface of the upper (21) of the footwear (10) at toe region thereof. At least one fastening means (5) is provided for securing the first and second protecting members (1,3) at the toe region of the footwear (10). The fastening means
30 (5) acts to hold the first and second protecting members (1,3) together and strengthen

the bond between them and the upper (21) of the footwear (10). The protecting members (1,3) may be formed of steel, metal, metal alloy, semi-rigid plastic or other suitable material. The purpose of the first protecting member (1) is to protect the toe region of the shoe from wear and to prevent gravel, dust, mud and dampness from getting in between the upper and sole of the footwear (10), and preserve these parts from decay. The purpose of the second protecting member (3) is to further protect and strengthen the toe region of the footwear (10) to provide a greater resistance against any external impact which would cause the wear of the toe region.

10 Referring to Figure 2, there is shown one embodiment the reinforced footwear (10) which the first and second protecting members (1,3) each have an inwardly turned flange (7,9). The inwardly turned flange (9) of the first protecting member (1) is laid beneath the bottom of the outsole (29) at the front portion thereof. The inwardly turned flange (7) of the second protecting member (3) is mounted between a middle sole (23) and a bottom layer (25) of the footwear (10).

Referring to Figure 3, there is shown another embodiment the reinforced footwear (10) which the first and second protecting members (1,3) each have an outwardly turned flange (11, 13). The outwardly turned flange (11) of the first protecting member (1) is laid on top of the upper (21) at the front portion thereof. The outwardly turned flange (13) of the second protecting member (3) is mounted between the upper (21) and the bottom layer (25) of the footwear (10). A second fastening means (5b) is provided to vertically secure the outwardly turned flanges (11,13) of the protecting members (1,3), upper (21), bottom layer (25) and outsole (29) of the footwear (10) together.

Referring to Figure 4, there is shown another embodiment the reinforced footwear (10) which the first protecting member (1) has an outwardly turned flange (11) and the second protecting member (3) has an inwardly turned flange (7). The outwardly turned flange (11) of the first protecting member (1) is laid on top of the outsole (29)

at the front portion thereof. The inwardly turned flange (7) of the second protecting member (3) is mounted between a middle sole (23) and a bottom layer (25) of the footwear (10). A first fastening means (5a) is provided to vertically secure the middle sole (23), the inwardly turned flange (7) of the second protecting member (3), bottom
5 layer (25), steel middle sole (27) and outsole (29) of the footwear (10) together. Preferably, a second fastening means (5b) is provided to vertically secure the outwardly turned flange (11) of the first protecting member (1) and the out sole (29) of the footwear together. Preferably, a third fastening means (5c) is provided to further secure the first protecting member (1), the second protecting member (3) and the
10 upper (21) at the top portion thereof.

Referring to Figure 5, there is shown another embodiment the reinforced footwear (10) which the first protecting member (1) has an outwardly turned flange (11) and downwardly turned front lip (15), and the second protecting member (3) has an
15 outwardly turned flange (13). The first protecting member (1) further comprises a downwardly turned front lip (15) extending from the edges of the outwardly turned flange (11). A second fastening means (5b) is provided to vertically secure the outwardly turned flanges (11, 13) of the protecting members (1,3), upper (21), bottom layer (25), steel middle sole (27) and outsole (29) of the footwear (10) together.
20 Besides providing a stronger protection to the upper (21) of the footwear (10), the downwardly turned front lip (15) allows any logos, symbols or other suitable markings to be printed, embossed or other suitable method thereon. The first protecting member (1) may further comprises an inwardly turned base (17) extending from the downwardly turned front lip (15) as shown in Figure 6, another embodiment
25 the reinforced footwear (10). A second fastening means (5b) is provided to secure the outwardly turned flanges (11, 13) of the protecting members (1,3), upper (21), bottom layer (25), steel middle sole (27), outsole (29) and inwardly turned bottom base (17) of the footwear (10) together.

Referring to Figure 7, there is shown another embodiment the reinforced footwear (10) which the first protecting member (1) has an outwardly turned flange (11) and downwardly turned front lip (15), and the second protecting member (3) has an inwardly turned flange (7). A second fastening means (5b) is provided to secure the

5 outwardly turned flanges (11) of the first protecting members (1) and outsole (29) together. The first protecting member (1) may further comprises an inwardly turned base (17) extending from the downwardly turned front lip (15) as shown in Figure 8, another embodiment the reinforced footwear (10). A second fastening means (5b) is provided to secure the outwardly turned flanges (11) of the first protecting members

10 (1), the outsole (29), and inwardly turned bottom base (17) of the first protecting members (1) together. Referring to Figure 9, there is shown another embodiment of the reinforced footwear (10) shown in Figure 8 further comprises a third fastening means (5c). The third fastening means (5c) is provided to further secure the first protecting member (1), the second protecting member (3) and the upper (21) at the top

15 portion thereof.

Referring to Figure 10, there is shown another embodiment the reinforced footwear (10) which the first protecting member (1) has an outwardly and inwardly turned flanges (9,11), and the second protecting member (3) has an inwardly turned flange

20 (7). The first protecting member (1) may further comprises and outwardly turned front lip (15) extending from the outwardly turned flange (11) as shown in Figure 11, another embodiment the reinforced footwear (10). The first protecting member (1) may further comprises an inwardly turned base (17) extending from the downwardly turned front lip (15) as shown in Figure 12, another embodiment the reinforced

25 footwear (10).

Referring to Figure 13, there is shown another embodiment the reinforced footwear (10) which shown in Figure 2 further comprises a third protecting member (30) at heel region the of the footwear (10). The third protecting member (30) having one part

30 mounted on the inner surface of the outsole (29) and the other part mounted on the

outer surface of the upper (21) at heel region of the footwear (10). The third protecting member (30) is in substantially L-shaped to conform to the shape of the heel region on which it is placed. At least one fastening means (31a, 31b) is provided to vertically secure the middle sole (23), bottom layer (25), steel middle sole (27),
5 third protecting member (30) and outsole (29), of the footwear together. A fastening means (31c) may be provided to horizontally secure the third protecting member (30) at the outer surface of the upper (21) at heel region of the footwear (10).

For the reinforced footwear (10) shown by Figures 2 to 13, a layer of lining (4) is
10 preferably secured on the inner surface of the second protecting member (3) and extending upward along the inner surface of the upper (21) to provide a soft and smooth surface behind the second protecting member (3). The lining (4) may be formed of nylon or other suitable material. A layer of insole (not shown) is preferably provided to cover the middle sole (23) and top portion of the fastening means (5)
15 which providing a cushioning surface for the interior bottom of footwear (10) directly beneath the foot of wearer. Preferably, the fastening means (5a, 5b, 5c) as shown by above Figures 2 to 13 is a rivet, a clasp, a screw or a stud.

Figure 14 is a protecting member (1,3) of the reinforced footwear (10) has an
20 inwardly turned flange (7,9). A plurality of apertures (6) is provided along the length of the inwardly turned flange (7,9) for fastening purpose. Figure 15 is an enlarged perspective view showing a protecting member (1,3) of the reinforced footwear (10) has an outwardly turned flange (7,9). A plurality of apertures (8) is provided along the length of the outwardly turned flange (11,13) for fastening purpose. The protecting
25 member of Figures 14 and 15 can be used as the first protecting member (1) or second protecting member (3) with different dimensions. Preferably, the first protecting member (1) has a bigger dimension than the second protecting member (3). Preferably, the first protecting member (1) is provided with integrally bulging bars on the top surface of the first protecting member (1) to strengthen the first protecting
30 member (1).

Figure 16 is a protecting member of the reinforced footwear (10) has an outwardly turned flange (11) and downwardly turned front lip (15). Figure 17 is a protecting member of the reinforced footwear (10) has an outwardly turned flange (11), downwardly turned front lip (15) and inwardly turned bottom base (17). Figure 18 is a
5 protecting member (1) of the reinforced footwear (10) has a combination of outwardly and inwardly turned flanges (9,11). Figure 19 is a protecting member (1) of the reinforced footwear (10) has a combination of outwardly and inwardly turned flanges (9,11) and downwardly turned front lip(15). Figure 20 is an enlarged perspective view showing a protecting member (1) of the reinforced footwear (10) has a
10 combination of outwardly and inwardly turned flanges (9,11), downwardly turned front lip (15), and inwardly turned bottom base (17). The protecting members shown in Figures 16 to 20 can only be used as the first protecting member (1). Preferably, the protecting members (1, 3) above each have a shape of a shell.

15 Although this disclosure has described and illustrated certain preferred embodiments of the invention, it is to be understood that the invention is not restricted to those particular embodiments. Rather, the invention include all embodiments which are functional or mechanical equivalence of the specific embodiments and features that have been described and illustrated.

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CLAIMS

1. Reinforced footwear (10) comprising:
a first protecting member (1) externally mounted on outer surface of the upper (21) of
5 the footwear (10) at toe region thereof;
a second protecting member (3) internally mounted on inner surface of the upper of
the footwear (10) at toe region thereof; and
at least one fastening means (5) of rivet or stud for securing the first and second
protecting members (1, 3) to the footwear (10), wherein the first and second
10 protecting members are made of steel, metal alloy or semi-rigid plastic.
2. Reinforced footwear (10) according to claim 1, wherein the first and second
protecting members (1, 3) each have an inwardly turned flange (7, 9) extending from
the bottom edges of the protecting members (1, 3).
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3. Reinforced footwear (10) according to claim 1, wherein the first and second
protecting members (1, 3) each have an outwardly turned flange (11, 13) extending
from the bottom edges of the protecting members (1, 3).
- 20 4. Reinforced footwear (10) according to claim 1, wherein the first protecting member
(1) has a combination of inwardly and outwardly turned flanges (9, 11) extending
from the bottom edges of the first protecting member (1).
5. Reinforced footwear (10) according to claim 3 or 4, wherein the first protecting
25 member (1) further comprises an downwardly turned front lip (15) extending from the
outwardly turned flange (11).
6. Reinforced footwear (10) according to claim 5, wherein the first protecting member
(1) further comprises an inwardly turned bottom base (17) extending from the
30 downwardly turned front lip (15).

7. Reinforced footwear (10) according to claim 2, wherein a combination of the first protecting member (1) with the inwardly turned flange (9) and the second protecting members (3) with the inwardly turned flange (7) are secured together.

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8. Reinforced footwear (10) according to claim 3, wherein a combination of the first protecting member (1) with the outwardly turned flange (11) and the second protecting members (3) with the outwardly turned flange (13) are secured together.

10 9. Reinforced footwear (10) according to claim 2 or 3, wherein a combination of the first protecting member (1) with the outwardly turned flange (11) and the second protecting members (3) with the inwardly turned flange (7) are secured together.

15 10. Reinforced footwear (10) according to claim 3 or 5, wherein a combination of the first protecting member (1) with the outwardly turned flange (11) and the downwardly turned front lip (15), and the second protecting members (3) with the outwardly turned flange (13) are secured together.

20 11. Reinforced footwear (10) according to claim 3 or 6, wherein a combination of the first protecting member (1) with the outwardly turned flange (11), the downwardly turned front lip (15) and the inwardly turned bottom base (17), and the second protecting members (3) with the outwardly turned flange (13) are secured together.

25 12. Reinforced footwear (10) according to claim 2 or 5, wherein a combination of the first protecting member (1) with the outwardly turned flange (11) and the downwardly turned front lip (15), and the second protecting members (3) with the inwardly turned flange (7) are secured together.

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13. Reinforced footwear (10) according to claim 2 or 6, wherein a combination of the first protecting member (1) with the outwardly turned flange (11), the downwardly turned front lip (15) and the inwardly turned bottom base (17), and the second
5 protecting members (3) with the inwardly turned flange (7) are secured together.

14. Reinforced footwear (10) according to claim 2 or 4, wherein a combination of the first protecting member (1) with inwardly and outwardly turned flanges (9, 11) and the second protecting members (3) with the inwardly turned flange (7) are secured
10 together.

15. Reinforced footwear (10) according to claim 4 or 5, wherein a combination of the first protecting member (1) with inwardly and outwardly turned flanges (9, 11), the downwardly turned front lip (15), and the second protecting members (3) with the
15 inwardly turned flange (7) are secured together.

16. Reinforced footwear (10) according to claim 4 or 6, wherein a combination of the first protecting member (1) with inwardly and outwardly turned flanges (9, 11), the downwardly turned front lip (15), the inwardly turned bottom base (17) and the
20 second protecting members (3) with the inwardly turned flange (7) are secured together.

17. Reinforced footwear (10) according to according to claim 1, wherein the first and second protecting members (1, 3) each have a shape of a shell.
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18. Reinforced footwear (10) according to claim 1, wherein the first protecting member (1) is provided with integrally bulging bars on the top surface of the first protecting member (1) to strengthen the first protecting member (1).

30 19. Reinforced footwear (10) according to claim 1, further comprising a third

protecting member (30) having one part mounted on the inner surface of the outsole (29) and the other part mounted on the outer surface of bottom layer at heel region the of the footwear (10).

- 5 20. Reinforced footwear (10) according to claim 19, further comprising at least one fastening means (31a, 31b, 31c) for securing the third protecting member (30) at the heel region of the footwear (10).

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