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EUROPEAN PATENT APPLICATION

⑫① Application number: **85102968.6**

⑫① Int. Cl.⁴: **A 43 C 15/16**

⑫② Date of filing: **14.03.85**

⑫③ Priority: **16.03.84 IT 5314084 U**

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⑫④ Date of publication of application: **11.12.85**
Bulletin 85/50

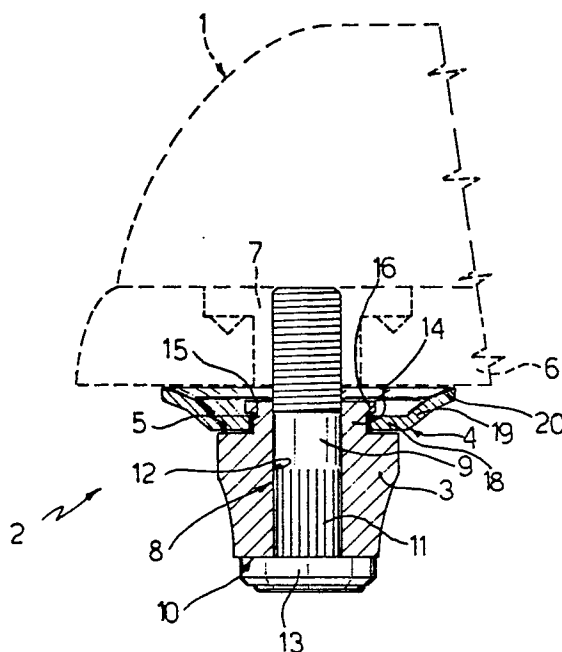
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⑫④ Designated Contracting States: **AT BE CH DE FR GB LI LU NL SE**

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⑫④ **Screw-on stud for sports shoes.**

⑫⑦ Stud (2) having a truncated-cone body (3), a screw (8) fitted through and angularly integral with the said truncated-cone body (3), and a cup washer (4) secured in idle manner to the said truncated-cone body (3) by means of an annular ridge (14) on the latter and appropriate shoulder means (16); the said screw (8) having a head (13) resting on the small end (10) of the truncated-cone body (3) and shaped in such a manner as to form the bearing underpart of the said stud (2) resting on the ground.



TITLE MODIFIED
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PERFECTED SCREW-ON STUD FOR SPORTS SHOES

The present invention relates to a perfected screw-on stud for sports shoes, particularly football boots.

- 5 Sports shoes are known to be fitted with screw-on studs selected according to the condition of the terrain on which they are to be employed. Such known types of studs comprise a truncated-cone body, the latter forming the body of the stud itself and having its small end shaped
- 10 in such a manner as to rest on the ground, a threaded insert driven into the said truncated-cone body and projecting from the large end of the same, and a cup washer inserted between the truncated-cone body and the surface of the sole on the shoe, prior to screwing the said truncated-
- 15 cone body, by means of the said threaded insert, into a recess formed in the said sole. Studs of the aforementioned type present a number of drawbacks. Firstly, as the said threaded insert is simply driven in projecting manner into the said truncated-cone body, the latter resting directly
- 20 on the ground, the stud may easily be worked off the shoe,

owing to the said threaded insert, the driven part of which is simply knurled, working its way out of the said truncated-cone body following prolonged use of the stud. Furthermore, the employment of an essentially free-fitting washer, connected to no other component parts on the stud and inserted each time, prior to fitting on the stud, between the truncated-cone body and the sole on the shoe, may cause problems for the wearer, i.e. it may be assembled wrongly in such a position as to cause discomfort to the wearer, or it may, quite simply, be lost. In addition to these drawbacks, the said washer may even be worked out of place after assembly or, when screwing on the stud, it may be turned together with the truncated-cone body, thus ruining the sole on the shoe.

15 The aim of the present invention is to provide a screw-on stud of the aforementioned type involving none of the aforementioned drawbacks, i.e. one providing for easy, cheap manufacture and reliable use, and for ensuring against withdrawal of the stud and/or loss or displacement of the washer.

20 With this aim in view, the present invention relates to a screw-on stud for sports shoes, the said stud comprising a truncated-cone body, a threaded member secured integral with the said truncated-cone body and designed to screw into a recess formed in the sole on the said shoe, and a cup washer mounted essentially coaxial with the said threaded member between the large end of the said truncated-cone body and the bearing surface of the said sole, the said stud being characterised by the fact that

the said threaded member consists of a screw fitted through and secured angularly integral with the said truncated-cone body, and that it comprises means for securing the said washer in idle manner on to the said truncated-cone body; the said screw comprising a threaded shank, projecting from the large end of the said truncated-cone body, and a head resting on the small end of the said truncated-cone body and shaped so as to form the bearing part of the said stud resting on the ground.

Two non-limiting arrangements of the present invention will now be described with reference to the attached drawings in which :

- Fig.1 shows a section of a stud according to the present invention, fitted inside a recess on a shoe shown only in part for simplicity;
- Fig.2 shows a longitudinal section of a variation to the Fig.1 stud.

Number 1 in Fig.1 indicates a sports shoe, in particular, a football boot or other field-sport shoe, only the front part of which is shown by the dotted line for simplicity. Number 2 in Fig.1 shows a screw-on stud for shoe 1, the said stud 2 being shown out of scale in relation to shoe 1, for the sake of clarity. The said stud 2 comprises a truncated-cone body 3, made of metal such as aluminium or synthetic plastic resin such as nylon; a washer 4, preferably cup-type, inserted between the large end of body 3 and the bearing surface of sole 6 on shoe 1; and a threaded member for securing body 3 and washer 4 to sole 6 and designed to screw into a respective recess 7 consisting, for example, of a metal boss driven into sole 6 on

shoe 1. According to the present invention, the said threaded member consists of a screw 8 fitted right through truncated-cone body 3 and secured axially and angularly in
5 tegral with the same by means of a threaded shank 9 comprising, on the small-end side 10 of body 3, a knurled portion 11 designed to engage with the inner surface of a through hole 12 in body 3 inside which the said shank 9 is housed. The latter projects axially from the large end 5 of body 3 by a given length enabling it to be screwed into
10 recess 7. Screw 8 also comprises a head 13 formed in one piece with shank 9 and resting, when screw 8 is fitted inside body 3, on the small end 10 of the latter. The said head 13 is formed in such a manner as to cover the whole of small end 10, to define an extension of body 3 and essentially to act as the bearing part of stud 2 resting on
15 the ground. According to the present invention, stud 2 also comprises means for securing washer 4 in idle manner on to truncated-cone body 3, the said means comprising an annular ridge 14 formed in one piece with the large end 5
20 of truncated-cone body 3 and projecting from the surface of the said large end 5 by a given length greater than the thickness of washer 4. According to the present invention, the said washer 4 is provided with a centre hole 15 designed to engage in idle manner with ridge 14 on which washer
25 4 is mounted coaxial with body 3 and shank 9 on screw 8. For securing washer 4 on to ridge 14, the latter is also provided on its free end with shoulder means designed to engage with the inner face of washer 4 for preventing axial movement of the same and consisting, according to
30 the non-limiting example shown, of an elastically deformed

(e.g. clinched) end 16 on ridge 14 permanently set after fitting screw 8 inside body 3 and washer 4 on to ridge 14. According to the present invention, washer 4 also comprises an essentially flat bottom wall 18, engaging
5 with large end 5, and a slanting annular side wall 19, essentially truncated-cone-shaped and blending widely with wall 18 with which, according to the present invention, it forms an angle of essentially 130-132°. Finally, washer 4 presents an annular truncated-cone edge 20 hav-
10 ing a different angle from slanting side wall 19 and formed in such a manner as to blend with the surface of sole 6.

Operation of stud 2 according to the present invention will be clear from the foregoing description. After fit-
15 ting screw 8 inside body 3 and washer 4 on to annular ridge 14 on the said body 3, end 16 on the said ridge 14 is set so as to lock washer 4 on to body 3. Engaging in idle manner with ridge 14, the said washer 4 is thus allowed to turn in relation to body 3 so that, when stud 2 is
20 screwed into recess 7, washer 4 is unaffected by the torque on shank 9 produced by turning body 3 manually, e.g. using a wrench, thus leaving the sole of shoe 1 undamaged. Similarly, any strain transmitted between the ground and shoe 1 via stud 2 has no effect on washer 4,
25 which thus undergoes no displacement and ensures not only long working life of sole 6 but also maximum comfort for the wearer of shoe 1 fitted with studs according to the present invention. As washer 4 is prevented from working its way out of support 14, it obviously cannot be lost.
30 Furthermore, the fact that washer 4 need no longer be re-

peatedly inserted correctly by hand between body 3 and sole 6 provides for fast, easy assembly and removal of stud 2. Washer 4, in fact, is already assembled in the ideal position and forms, together with body 3 and screw 8, a one-piece stud 2 which may be assembled or removed in one single operation. Finally, stud 2 according to the present invention is prevented from working its way out of sole 6 in that, once stud 2 is screwed into recess 7, body 3 is locked entirely between washer 4, resting on sole 6, and head 13 on screw 8 resting on the ground. Hence, replacing the traditional threaded insert with screw 8 according to the present invention prevents any possibility of body 3 working loose, whereas head 13 provides for improved transmission and distribution of mechanical strain exerted on stud 2 itself. All the aforementioned results and advantages are also and especially provided for by the special design of washer 4 and, in particular, by the angle provided for between walls 18 and 19 on the same, the said angle being determined by years' of experimental research conducted by the present Applicant.

Number 22 in Fig.2 shows a variation of the Fig.1 stud, in which, for the sake of simplicity, similar or identical parts to those already described are indicated by the same numbers. Stud 22, of which only body 3 and washer 4 are shown for simplicity, is practically identical with stud 2, the only difference being the design of body 3 which is designed to enable it to be formed exclusively from synthetic plastic resin, instead of metal. Consequently, screw 8 (omitted for simplicity in Fig.2) may be in-

serted into hole 12 on plastic body 3 subsequent to formation of the latter, as in the case of stud 2, or preferably, it may be inserted inside body 3 during molding of the latter, so as to be embedded inside truncated-cone
5 body 3 on finished stud 22. Like body 3 on the Fig.1 stud 2, the truncated-cone body 3 on stud 22 is provided with an annular ridge 14 on its large end 5, the said ridge 14 being engaged in idle manner by washer 4 identical with the one on stud 2. To secure washer 4 on to annular ridge
10 14 and so prevent axial withdrawal, ridge 14 is provided with a number (preferably three) of elastically deformable teeth 25 formed in one piece with the free end of ridge 14 when molding body 3 and designed to flex in the direction of the axis of hole 12, so as to enable washer 4 to be
15 clicked on to ridge 14, and subsequently to lock the said washer 4 on the said ridge 14. Teeth 25 are preferably serrated, each having a flared surface 26 with its tapered end facing the opposite way to small end 10, so as to enable washer 4 to be clicked easily on to ridge 14 and,
20 once inserted, prevent washer 4 from being withdrawn, unless teeth 25 are broken. Thus, stud 22 also forms one piece which may be assembled or removed in one single operation. The advantages and operation of stud 22 are the same as already described in connection with stud 2.
25 The advantages of the stud according to the present invention and of the sports shoes fitted with the same will be clear from the foregoing description. To those skilled in the art it will be clear that changes may be made to the invention described herein without, however, departing
30 from the scope of the same.


(Dr. Ing. PRATO Roberto)

CLAIMS

1) - Screw-on stud (2) for sports shoes (1), the said stud (2) comprising a truncated-cone body (3), a threaded member (8) secured integral with the said truncated-cone body (3) and designed to screw into a recess (7) formed in the sole (6) on the said shoe (1), and a cup washer (4) mounted essentially coaxial with the said threaded member (8) between the large end (5) of the said truncated-cone body (3) and the bearing surface of the said sole (6), the said stud (2) being characterised by the fact that the said threaded member consists of a screw (8) fitted through and secured angularly integral with the said truncated-cone body (3), and that it comprises means (14, 16, 25) for securing the said washer (4) in idle manner on to the said truncated-cone body (3); the said screw (8) comprising a threaded shank (9), projecting from the large end (5) of the said truncated-cone body (3), and a head (13) resting on the small end (10) of the said truncated-cone body (3) and shaped so as to form the bearing part of the said stud (2) resting on the ground.

2) - Stud (2) according to Claim 1, characterised by the fact that the said means for securing the said washer (4) in idle manner to the said truncated-cone body (3) comprise an annular ridge (14), formed in one piece with the said truncated-cone body (3) and projecting from the said large end (5) of the same, and shoulder means (25, 16) for securing the said washer (4) on to the said annular ridge (14); the said washer (4) being provided with a centre hole (15) engaging in idle manner with the said

annular ridge (14).

3) - Stud (2) according to Claim 1 or 2, characterised by the fact that the said truncated-cone body (3) is made of metal; the said shoulder means consisting of a clinched
5 end (16) on the said annular ridge (14).

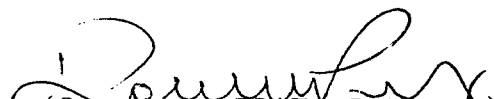
4) - Stud (2) according to Claim 1 or 2, characterised by the fact that the said truncated-cone body (3) is made of synthetic plastic resin; the said shoulder means consisting of respective elastically deformable teeth (25) formed
10 in one piece with the free end of the said annular ridge (14).

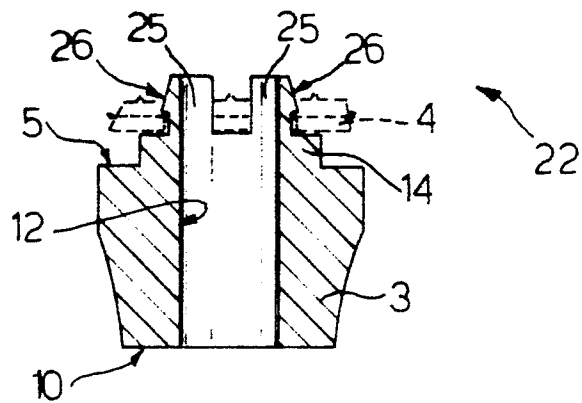
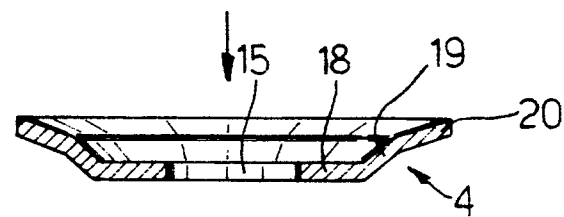
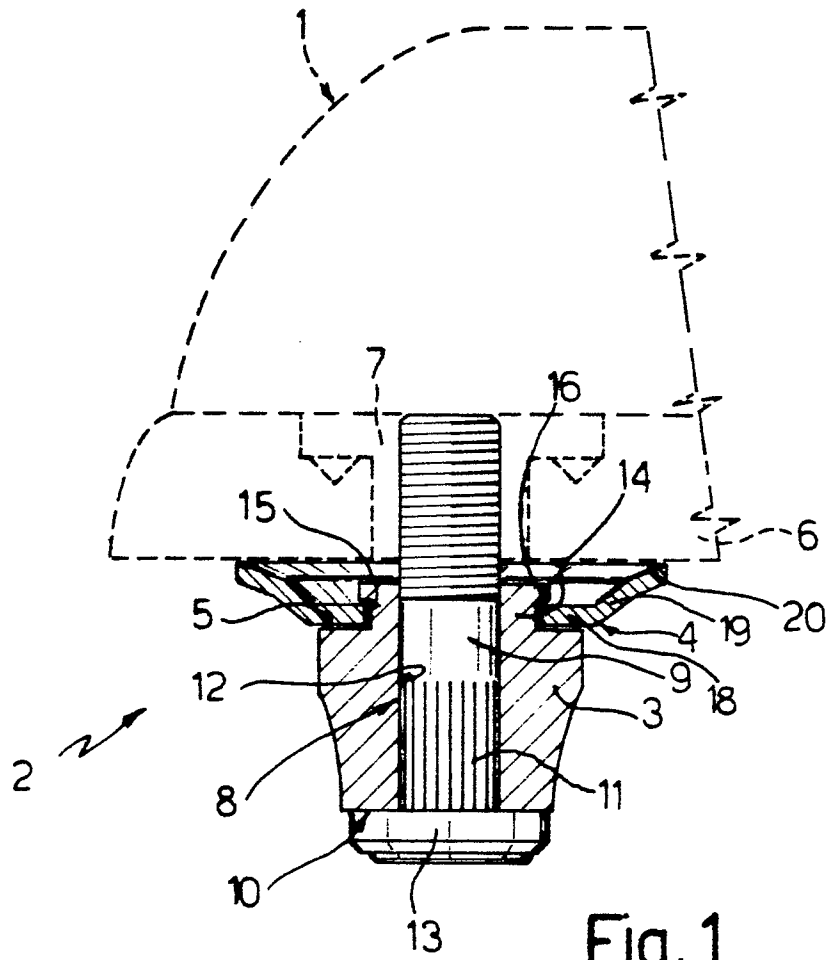
5) - Stud (2) according to one of the foregoing Claims, characterised by the fact that the said cup washer (4) comprises an essentially flat bottom wall (18), engaging with
15 the said large end (5) on the said truncated-cone body (3), and a slanting, annular side wall (19) forming, with the said bottom wall (18), an angle of essentially 130-132°.

6) - Stud (2) according to one of the foregoing Claims, characterised by the fact that a portion (11) of the shank
20 (9) on the said screw (8) is knurled so as to ensure angular connection of the said screw (8) to the said truncated-cone body (3).

7) - Stud (2) according to Claim 4 or 5, characterised by the fact that the said screw (8) is embedded inside the
25 said truncated-cone body (3).

8) - Sports shoe (1) characterised by the fact that it comprises a sole (6) fitted with screw-on studs (2) according to one of Claims 1 to 5.


(Dr. Ing. PRATO Roberto)





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EUROPEAN SEARCH REPORT

0163823

EP 85 10 2968

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US-A-3 101 763 (A.B. McGEHEE) * Claim; figures 1-4 *	1-8	A 43 C 15/16
A	GB-A- 714 531 (M.O. DOSS) * Figure 3 *	1,8	
A	US-A-2 787 843 (F.C. PHILLIPS) * Figures 1-5 *	1,8	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			A 43 C A 43 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-06-1985	Examiner MALIC K.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	