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(71) Applicant: **Luxstamp s.a.s.**
35020 Ponte San Nicolo'Pd (IT)

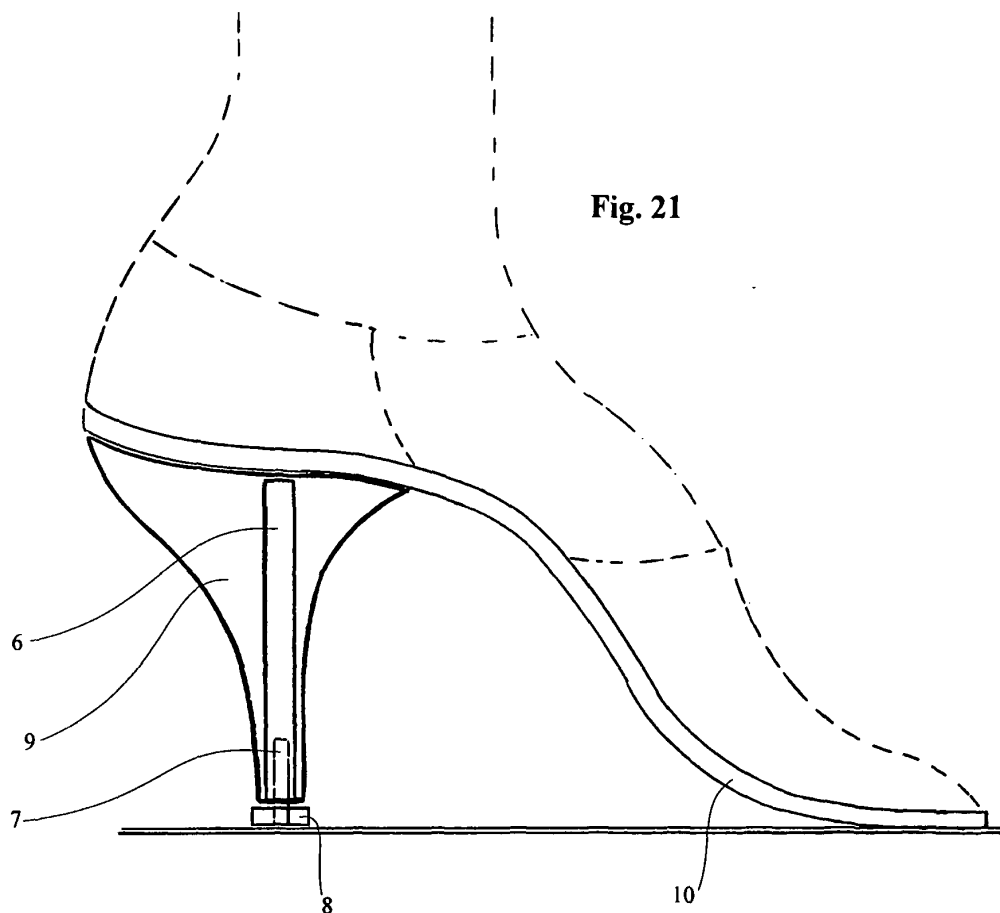
(72) Inventor: **Masiero, Mauro**
35020 Polverada PD (IT)

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(54) **Metal reinforcement for heels**

(57) An element finding place in shoe heels, in particular of woman's shoes, which has the function of reinforcing the same thin heel. That reinforcement core is characterized by a structure and a cost which are comparable with commonly used cores, but with a bigger moment of inertia. The structure is a extended tubular

configuration 6 with edges near to each other which are folded up inwards and leaned against the internal part of the external element 6, edges which almost make a second internal tubular element, with the expedient that said internal tubular element doesn't concern the end part of the base, leaving the cavity free for the insertion of the nail 7 of the low heel 8.



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Description

[0001] In the field of shoes it is well known that a wide range of women's shoes exists with particular forms and different configurations. Among all kind of shoes that one, which have always worn over the time are the shoes with a very high heel.

[0002] When the heel is either high nor thin, there is the problem of the stability. This kind of heel has to assure of supporting all weight with security and of being resistant to the various stress, even those transversal one.

[0003] We are in the field of women shoes with stiletto heels. Nowadays in the stiletto heels some metal, thin and long elements with a cylindrical form are usually inserted as a reinforcement for the heel, that does not guarantee a strong resistance. In the present market this kind of reinforcement is the most used, considering that the piece of reinforcement, whose position is at the bottom of the heel, has to have an axial cavity where inserting a nail. The low heel is fixed by the nail and together with the sole enters in contact with the floor. The most simple metal reinforcement is made by steel sheet and it assumes the form of a little tube with both edges near to each other (in touch each other).

[0004] The diameter of the internal cavity, that concerns the entirely length of the little tube, is as long as the nail inserting in the tube in order to fix the low heel. The length of the external diameter, depending on the thickness of the used sheet, is defined by the market.

[0005] A second type of metal reinforcement is made like the first one but this one has a second sheet little tube into its cavity in order to strengthen the heel. The length of this little tube ends before the base to let insert into the cavity the nail of the low heel for the contact with the floor. This second solution gives a bigger strength to the metal reinforcement because the resistance of the internal little tube is added to that one of the external little tube.

[0006] The third type of metal reinforcement has a bigger strength but it is more expensive. It is produced like the first one but this third type has inside an added steel drawn nail which ends before the base in order to leave the space in the final part for the insertion of the low heel.

[0007] The fourth type of metal reinforcement, that would be the strongest type but that it is too much expensive, consists of a full steel drawn nail in which the axial cavity, for the insertion of the nail of the low heel, is produced through a mechanical drilling process (blind).

[0008] To get a certain resistance, the various solutions, even those simple one, need a tempering process in add to the first processing which gives the sheet piece a cylindrical form. To check the resistance of these tubular elements, experts usually try a test called "a carico di punta" in which the elements present a moment of inertia that is weaker than the strength of the stress that they usually have to support.

[0009] Nowadays the first, the second and the third type of metal reinforcement are usually used, even though they present some disadvantages: a high cost of labour for their packaging and their weakness to support any weight. The fourth type of reinforcement is not used because it is too much expensive. It consists of a full steel drawn nail in which the axial cavity, for the insertion of the low heel nail, is obtained from a mechanical drilling process.

[0010] The best metal reinforcement with a low cost and a strong resistance, similar to that one of the reinforcement obtained from the full steel nail, is produced with this patent.

[0011] The metal reinforcement of this patent derived from a only long sheet piece and it consists of two tubular elements inserted one into the other. The advantage of this kind of metal reinforcement, compare to the reinforcement with two distinct tubular elements one inside the other, is a remarkable strengthening where the edges are placed, thanks to the folding up piece of sheet piece that forms two strong lips.

[0012] In the metal reinforcement with two distinct tubular elements one inside the other, the moment of inertia is weak in the point where there are the two edges near to each other but it is stronger if the reinforcement have the lips made by a folding up sheet like this patent suggests. Up to now no one has ever realized this solution because of some technical difficulties derived from the limits established by the market. To get the metal reinforcement of this patent, it needs a sheet piece with thickness and adequate development to which a part is removed for creating the cavity where inserting the nail of the low heel.

[0013] The following pictures show what we said above.

Picture 1 shows a metal reinforcement for heels for woman's shoe with a cylindrical form, produced with a steel sheet.

Picture 2 is the longitudinal part of the metal reinforcement represented in the picture 1.

Picture 3 is the transversal part of the metal reinforcement represented in the picture 1.

Picture 4 concerns a cylindrical tubular element that is externally seen; that is obtained from a piece of steel sheet and that is inserted in the cavity of the main element represented in the pictures 1, 2 and 3, in order to strengthen the heel.

Picture 5 shows the longitudinal part of the picture 4; picture 6 shows the transversal part.

Pictures 7 and 8 regard a full steel nail that is either externally seen nor in section and that is inserted in the cavity of the main element represented in picture 1, 2 and 3, in order to strengthen the heel.

Pictures 9, 10, 11 and 12 show a metal reinforcement for heels for woman's shoes which consists of a full steel nail with an axial cavity. A part of this nail is externally seen and under two transversal parts,

which are taken either where there is the full part of the nail nor where there is the part with the axial cavity.

Pictures 13 und 14 show a metal reinforcement for heels for woman's shoes with a cylindrical form, produced under the patent. It is obtained from a piece of processed steel sheet represented in the picture 17, folding up in advance the longitudinal edges that lean inside the reinforcement and that have a reduced length. Therefore this process lets make the tubular folding that represents the tubular internal part of the metal reinforcement. This part is used for the inserting the nail of the low heel.

Picture 15 and 16 represented the transversal sections where the sheet has a double layer and where the sheet has only one layer (in the cavity).

Picture 17 show the sheet piece with longitudinal edges to fold up and with a reduced length. The cavity for the insertion of the nail of the low heel is obtained from this processed sheet piece.

Pictures 18 and 19 are the sections of the sheet piece in the picture 17, seen under the entirely breadth and under the smaller breadth that is reduced in order to limit the length of the edges to fold up.

Picture 20 shows the enlarged Part B-B of the picture 15.

Picture 21 shows in a schematic way a woman's shoe with heel, having a support low heel for underline the position of the metal reinforcement.

[0014] As you can see in the various pictures, the steel reinforcement inserting in the heel for woman's shoe as first solution, represented in the pictures 1, 2, 3, can be produced using only a tubular element 1, obtained from the steel sheet with thickness S and the edges near to each other, having external diameter D1 and internal diameter D2.

[0015] The diameter D2 of the internal cavity is as long as the diameter of the nail 7 applied to the support low heel 8.

[0016] As second solution, the metal reinforcement is obtained inserting the tubular element 2 into the tubular element 1 that is represented in pictures 4, 5 and 6 and that is obtained from steel sheet with the edges near to each other, having the external diameter D2 as long as the diameter of the internal cavity of the element 1.

[0017] The tubular element 2 has a length shorter than that one of the element 1 in order to leave available a piece of cavity on the tip in the element 1 as long as the nail 7 applied to the low heel 8.

[0018] As third solution, the metal reinforcement is obtained inserting the steel drawn nail 3 inside the tubular element 1 represented in pictures 7 and 8, having the external diameter D2 as long as the diameter of the internal cavity of the element 1.

[0019] The nail 3 is shorter than the element 1 in order to leave available in the element 1 a piece of cavity on

the tip as long as the nail 7 applied to the low heel 8.

[0020] The metal reinforcement, with a full steel nail 4 and a cavity on one tip, has a low consideration because of its high cost.

[0021] This patent offers a cheap metal reinforcement with a strong resistance. This reinforcement is obtained from a sheet piece 5 (see pictures 17, 18 and 19), folding up in advance the two longitudinal edges that have a reduced length in the part X and that they lean inside the reinforcement. This process lets get the internal tubular part inside of the metal reinforce 6. (see pictures 13, 14, 15 and 16). This part does not depending on the axial central part on the tip where the nail 7 of the low heel 8 is inserted.

[0022] Before the insertion of the metal reinforcement 6 in the heel 9, the sole is applied to the shoe.

[0023] The low heel 8 is applied to the heel 9 thanks to the nail 7 that is inserted in the axial cavity of the reinforcement 6.

[0024] The final object of the invention can be obtained from a sheet piece with the reduction X in the central part and in consequence modifying the folding process.

[0025] The invention results new and original thanks to the use of the sheared piece of steel sheet that lets a reduction in costs and a strong resistance to the stress.

[0026] The copy of this patent, made following all the directions described above, means creating a product that would be not original because it would have the same features of our metal reinforcement.

Claims

1. Metal reinforcement for heels obtained from a only steel sheet piece, making a tubular form to insert the high heel for woman's shoes heel whose its edges, near to each other, are folding up in the internal cavity.
2. Metal reinforcement for heels according to claim 1 **characterized by** edges, near to each other and with a tubular form (6). Both edges are folding up towards the internal part of the cavity and lean on the internal wall, forming two strong lips and increasing the moment of inertia where the two lips are placed.
3. Metal reinforcement for heels according to claim 1 and 2 **characterized by** the fact that the fold of the edges, near to each other and with a tubular configuration (6) towards the internal part of the cavity, leaning on the internal wall, lengthens along the entirely internal wall, forming a second tubular configuration that adheres to the external configuration.
4. Metal reinforcement for heels according to one or

more of the preceding claims, **characterized by** the fact that the final part of the reinforcement (6) where the base is situated does not contain the folding up edges because this final part has only the free space for the insertion of the nail (7) of the low heel (8). 5

5. Metal reinforcement for heels according to claim 1 **characterized by** the fact that the steel sheet piece (5) assumes a form with two breadth in order to obtain the metal reinforcement with a tubular configuration, the shorter breadth forms the external tubular configuration that concerns the part of the cavity for the insertion of the nail 7 of the low heel 8, after the folding up process for the edges, the larger breadth forms either the external tubular configuration nor the internal tubular configuration, adhering to the internal part of the external tubular configuration. 10 15 20

6. Metal reinforcement for heels characterized under all the preceding revendications. We want to underline that in the text we used descriptions and pictures to explain our product in a good way. 25

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Fig. 1

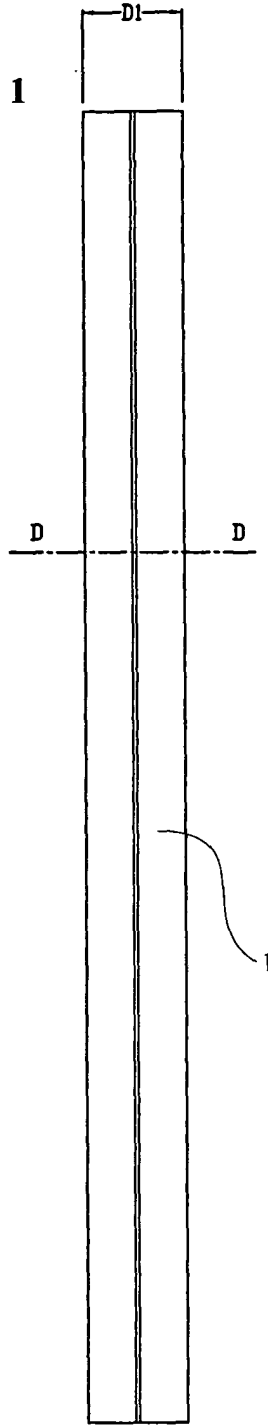


Fig. 2

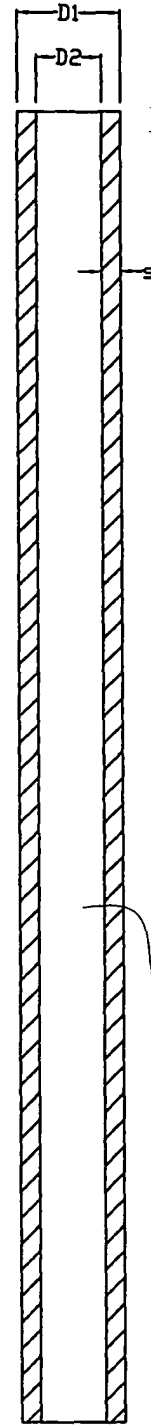
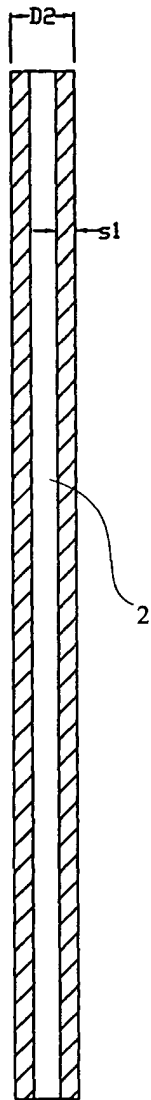


Fig. 5



Sez. D-D

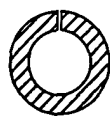
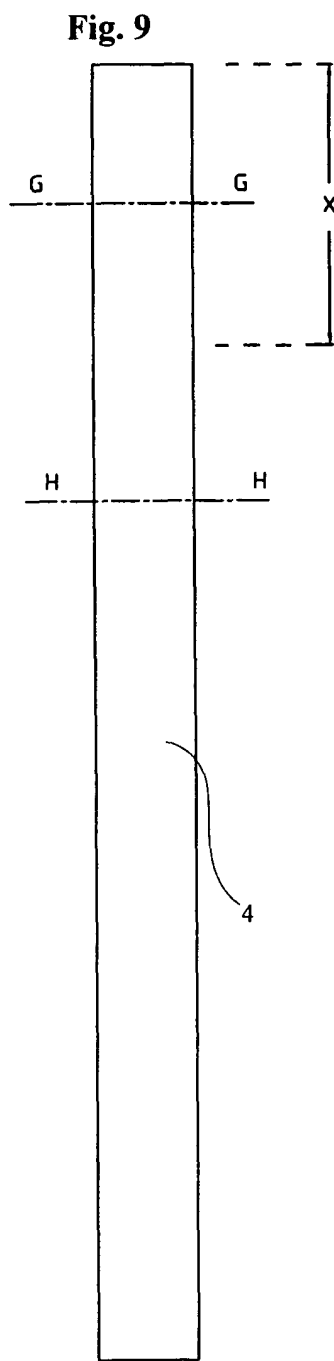


Fig. 3



Sez. H-H

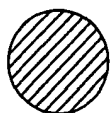
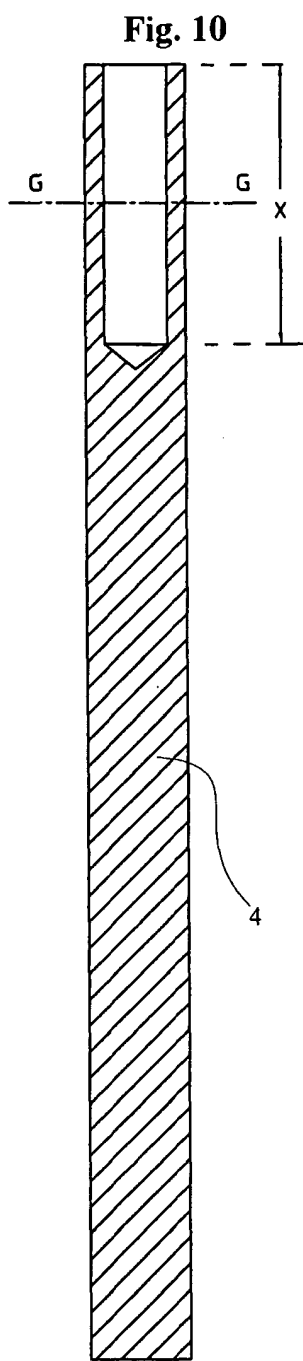


Fig. 12



Sez. G-G

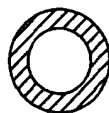
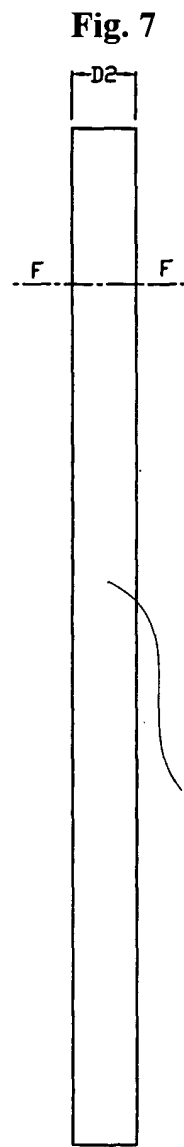


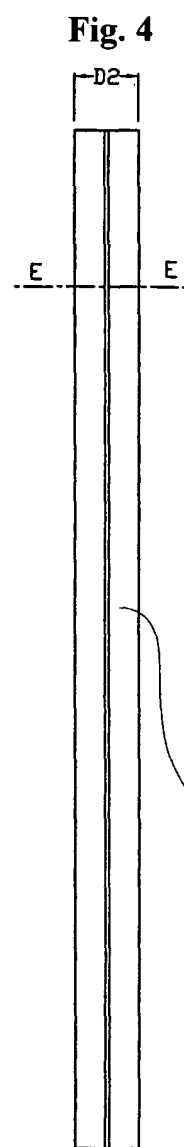
Fig. 11



Sez. F-F



Fig. 8



Sez. E-E



Fig. 6

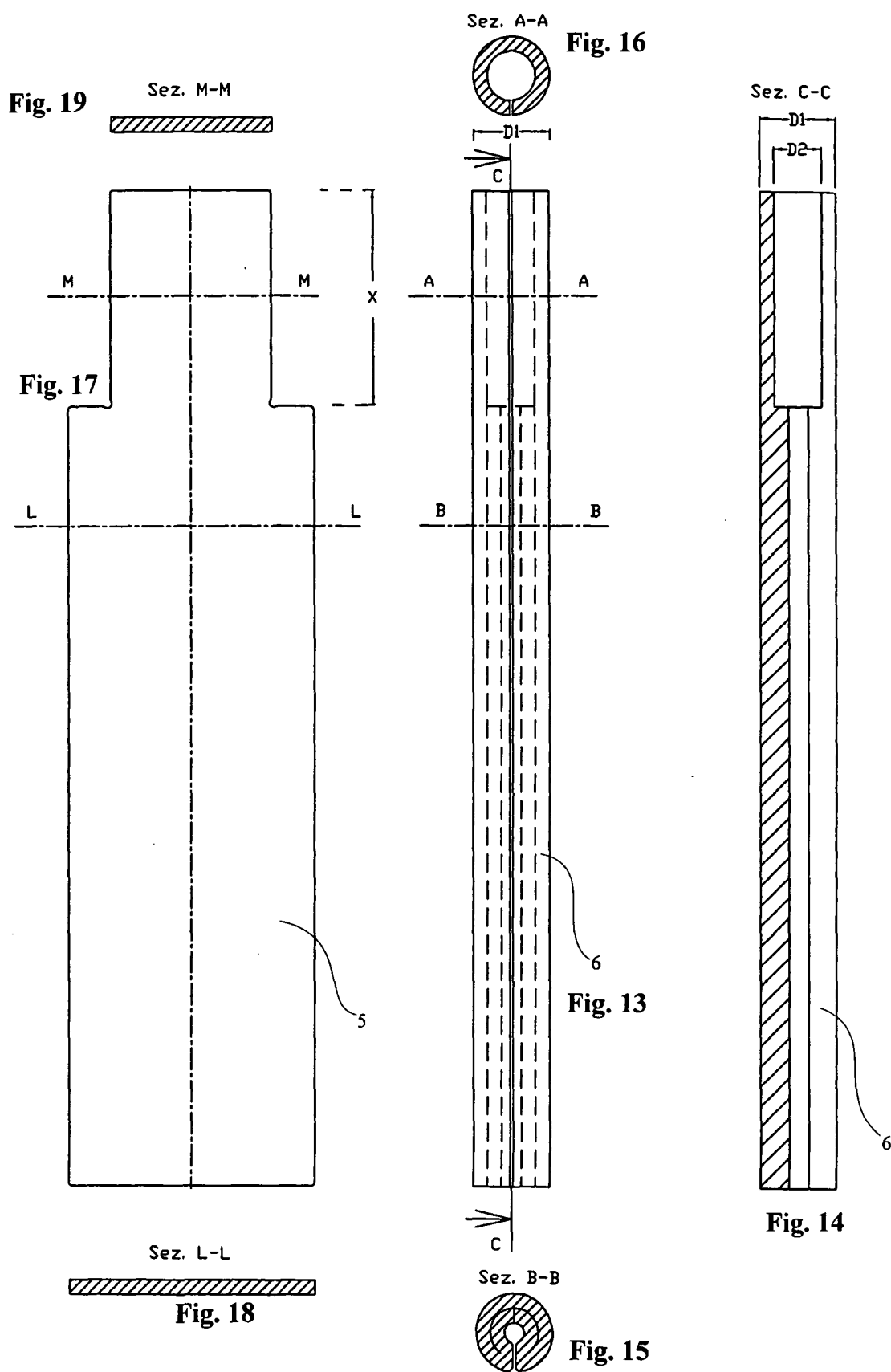


Fig. 20

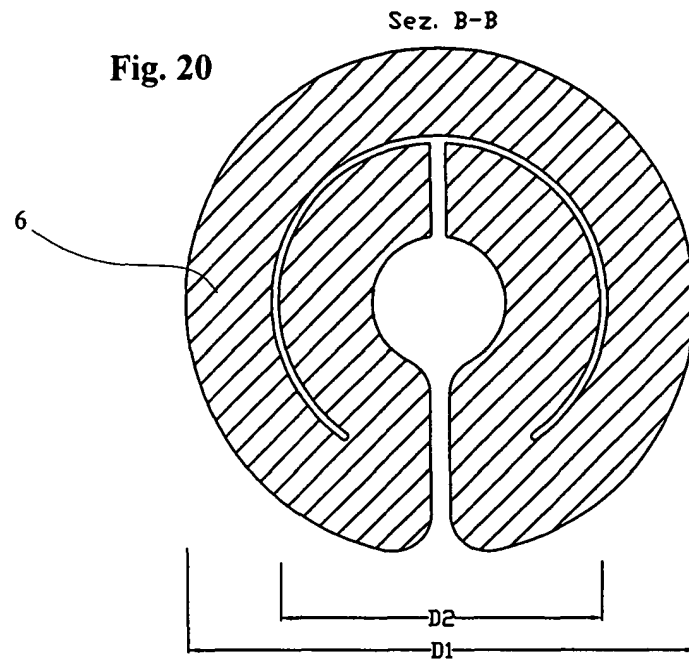


Fig. 21

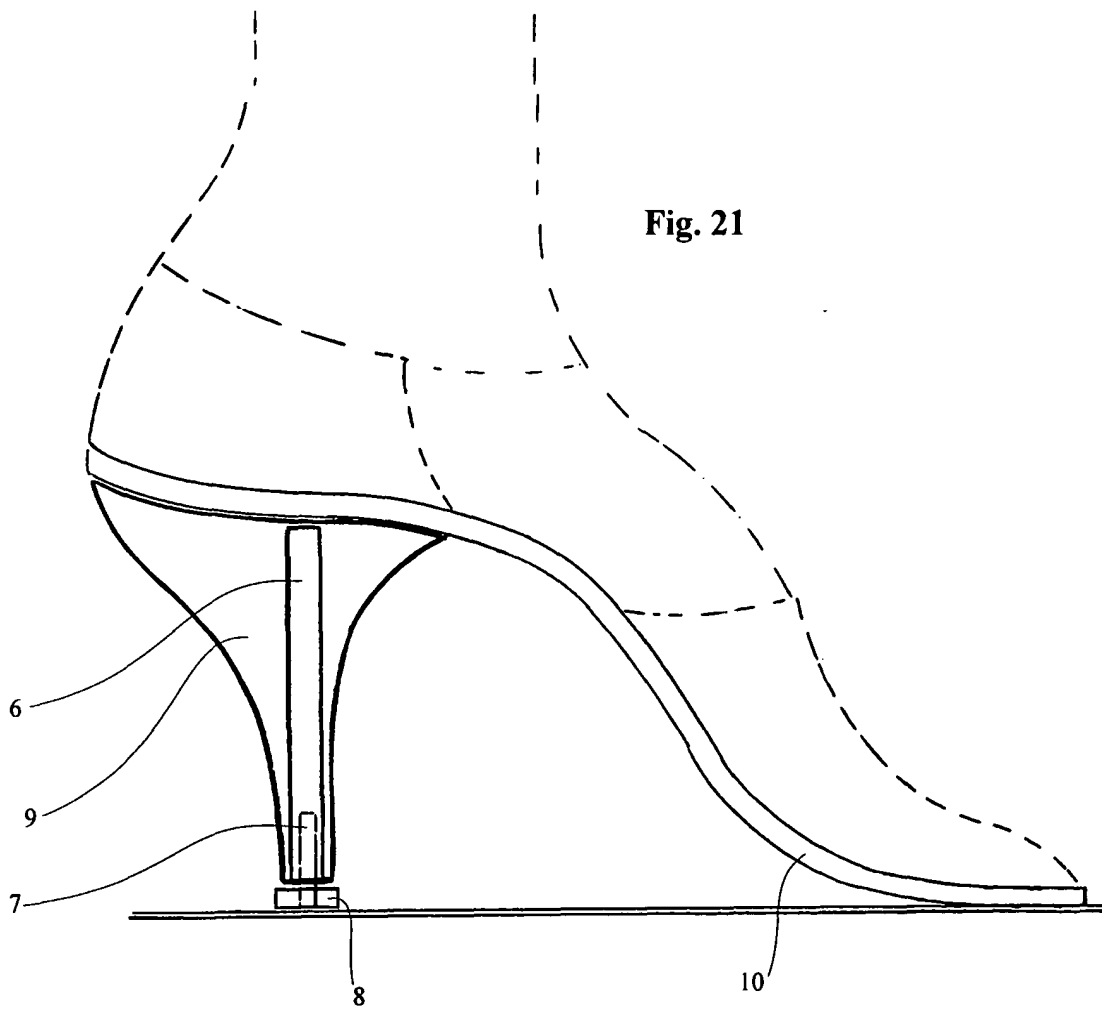
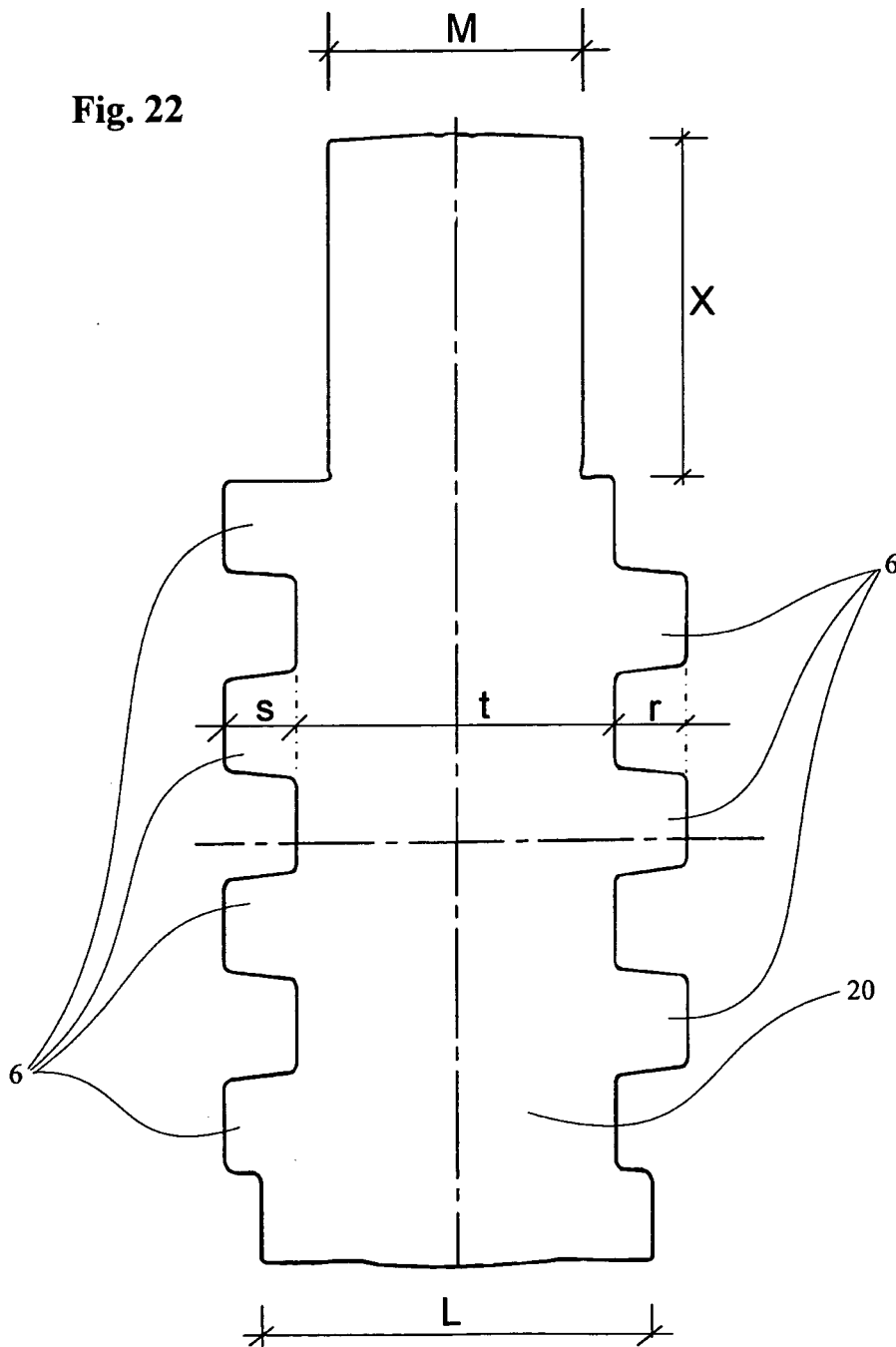


Fig. 22





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EUROPEAN SEARCH REPORT

Application Number
EP 04 01 3805

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.7)
X	GB 2 214 400 A (CHAMBERLAIN PHIPPS PLC) 6 September 1989 (1989-09-06) * the whole document *	1	A43B21/02 A43B21/24 A43B13/37
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X	US 3 184 865 A (RONCI FERNANDO M) 25 May 1965 (1965-05-25) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A43B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 November 2004	Examiner Cianci, S
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 01 3805

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26-11-2004

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