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(72) Inventor: **Carnielli, Enrico**
31053 Pieve di Soligo (Treviso) (IT)

(74) Representative: **Modiano, Guido, Dr.-Ing. et al**
Modiano & Associati,
Via Meravigli, 16
20123 Milano (IT)

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(71) Applicant: **Carnielli, Enrico**
31053 Pieve di Soligo (Treviso) (IT)

(54) **Knee and/or elbow protection device, particularly for use in building yards**

(57) A protection device (1) for knees and/or elbows, particularly for use in building yards, comprising a shell (2) that has a first layer (4) with which a second layer

(13) is associated at the rear, the second layer being detachably associable with a third temporary fixing layer (14) that is associated at the knee or elbow regions of a preset item of clothing.

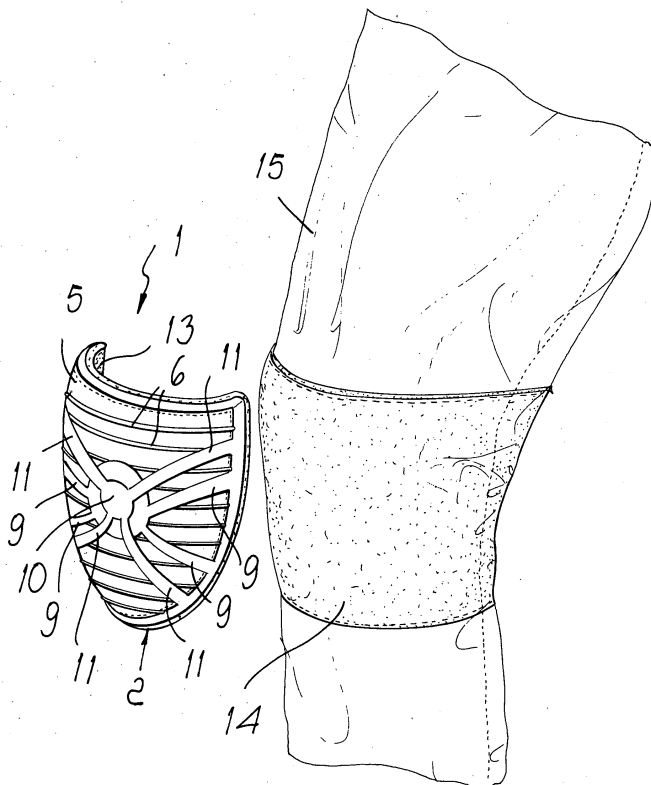


Fig. 3

Description

[0001] The present invention relates to a knee and/or elbow protection device, particularly for use in building yards.

[0002] Currently, for example in the building sector, it is known to provide protection devices for the knees of personnel engaged in performing manual tasks.

[0003] These known types of protection device, commonly known as knee-pads, are constituted by a semi-rigid anatomically-contoured plate of preset thickness, which is usually made of plastics and is approximately shaped like a shield.

[0004] Such known type of anatomically-contoured plate usually has an arc-like profile in transverse cross-section, in which the concavity is shaped approximately complementarily to the region of the leg that lies at the knee of the user, so as to allow to at least partially wrap around said region.

[0005] Tabs usually protrude at the lateral edges of such known types of knee-pad, and the ends of a band or strap are fastened to said tabs, said band or strap being made of an elastically deformable material, so as to allow the user, once he has put on the knee-pad, to lock it temporarily on the corresponding rear region of the knee.

[0006] The main drawback that can be observed in these known types of protection device is that in order to keep the plate adjacent to the knees the band or strap must be tight around the leg, and this can entail, after the user has been wearing such knee-pads for some time, reddening and/or irritations of the rear and lateral regions of the leg arranged in contact with the band or strap.

[0007] Another drawback is that the compression applied by the band or strap on the corresponding region of the leg can also hinder blood circulation locally, for example following prolonged use of the knee-pads by users who already have problems of poor blood circulation or users who are in any case forced to assume unsteady positions.

[0008] Another drawback is that the known types of knee-pad cannot be put on rapidly and easily, since the user has to constantly widen the band or strap and put them on from his feet and then slide the knee-pads upward until they are positioned at the preset regions of the knees.

[0009] This leads to a further drawback, which arises from the fact that besides being impossible to put them on rapidly and easily, when they are made to slide with respect to the trousers or overall, the known types of knee-pad can also cause unpleasant gathering of the fabric, thus making their insertion or removal even more problematic.

[0010] Another drawback arises from the fact that these known types of protection device, although appropriately fastening the band or strap around the leg of the user, can still move from the centered position with re-

spect to the corresponding knee region, for example as a consequence of accidental friction that can occur between the band or strap and any external objects during one or more movements performed by the user to stabilize or change the posture according to the various actions and/or tasks to be performed.

[0011] Another drawback is that although the anatomically-contoured plate of the protection devices is provided with different shapes, it is still not possible to use them in a versatile manner, for example by applying them at the elbow regions, since the fixing band or strap would be subjected to continuous slippage as a consequence of the possible flexing of the arms of the user, and this would also make the positioning of the anatomically-contoured plate unstable.

[0012] The aim of the present invention is to solve the above-mentioned problems, eliminating the drawbacks of the cited known art, by providing a device that allows to achieve optimum protection of the knees and/or elbows of the user and can be put on rapidly and easily.

[0013] Within this aim, an object of the invention is to provide a protection device that although being worn for prolonged periods allows the user to achieve a high degree of comfort, so as to avoid causing skin irritations, reddening or blood circulation problems.

[0014] Another object is to provide a protection device that can be arranged stably at the knee and/or elbow regions, so that it is not susceptible of movements or slippages even as a consequence of accidental impacts with other objects, caused for example by the flexing of the legs or arms of the user.

[0015] A further object is to provide a protection device that is reliable over time and therefore withstands various mechanical stresses, so that it is scarcely susceptible to deterioration and wear.

[0016] A still further object is to provide a protection device that allows the user to apply it and/or remove it easily regardless of the assumed posture or position.

[0017] Another object is to provide a protection device that allows the user to apply it to and/or remove it from trousers or overalls so as to prevent the occurrence of creases or gatherings in them.

[0018] Another object is to provide a device that is structurally simple and has low manufacturing costs.

[0019] This aim and these and other objects that will become better apparent hereinafter are achieved by a protection device for knees and/or elbows, particularly for use in building yards, characterized in that it comprises a shell that has a first layer with which a second layer is associated at the rear, said second layer being detachably associable with a third temporary fixing layer that is associated at the knee or elbow regions of a preset item of clothing.

[0020] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figures 1 and 2 are a front view and a perspective view of a protection device for knees or elbows; Figure 3 is a perspective view of the step for mutually coupling the rear surface of the device according to the preceding figures and a temporary fixing layer provided at the knee region of a preset item of clothing.

[0021] In the embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0022] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0023] With reference to the figures, the reference numeral 1 designates a protection device for knees and/or elbows, particularly for use in building yards.

[0024] The particular embodiment described relates to a device specifically used to protect the knee region; however, by merely giving the device 1 a different shape it is possible to apply such device for example at the elbow region of the user, so as to allow good versatility in use.

[0025] The device 1 comprises a shell, designated by the reference numeral 2, which has, in a front view, an approximately shield-like configuration, so as to form in a lower region a rounded edge, designated by the reference numeral 3, that is approximately shaped like an elliptical or circular arc.

[0026] The shell 2 further has, in a transverse cross-section, an essentially concave configuration, which is shaped approximately complementarily to the facing region of the user's knee, so that it can be arranged adjacent to said region, surrounding it at least partially.

[0027] The shell 2 is constituted by a first layer 4, preferably made of plastics, which is given preset rigidity or semirigidity characteristics.

[0028] A plurality of first ribs, each designated by the reference numeral 6, protrude at the first front surface, designated by the reference numeral 5, of the first layer 4; such ribs are arranged approximately horizontally at a preset distance from each other, so as to preferably affect the entire width of the first front surface 5.

[0029] The first ribs 6 are connected, at their ends, to a perimetric rim 7, which protrudes from the edges of the first front surface 5 so as to form thereon a closed border.

[0030] A first reinforcement plate, generally designated by the reference numeral 8, is associated or rigidly coupled, approximately centrally, with the first front surface 5, is flat or slightly curved, and has a substantially circular plan shape.

[0031] Four second ribs, designated by the reference numeral 9, extend approximately radially from the reinforcement plate 8, and starting from preset diametrical ends of said plate lie along respective oblique paths that

are slightly arc-like, so as to affect the entire width of the first front surface 5.

[0032] The first reinforcement plate 8, together with the second ribs 9, is designed to stiffen the central region of the first layer 4 of the shell 2, which is most in contact with the resting surfaces for the knees of the user.

[0033] A second centering plate 10 is advantageously associated or monolithically coupled in front of the first reinforcement plate 8 in order to position the shell 2 on the resting surface for the knees of the user, which is substantially similar in shape but smaller in size with respect to the first reinforcement plate 8.

[0034] Four third ribs, designated by the reference numeral 11, extend approximately radially from the second plate 10; they, too, start from preset diametrical ends of said plate, cross the first reinforcement plate 8 and cover, along respective paths that are substantially parallel to the corresponding second ribs 9, the entire width of the first front surface 5, so as to form an approximately X-shaped configuration.

[0035] The third ribs 11 assist the stiffening action performed by the second ribs 9, at the same time preventing any movements of the second plate 10.

[0036] A second layer 13, preferably made of a material known by the trade name Velcro, is associated with the second rear surface 12 of the layer 4 that is directed away from the first front surface 5 and has, in a plan view, a configuration and dimensions that are preferably similar to those of the first layer 4, so that when they overlap the respective perimetric edges match up.

[0037] With reference to the figures, the second layer 13, on the opposite side with respect to the second rear surface 12 of the first layer 4, can be coupled detachably to a third layer, designated by the reference numeral 14, which is made of a material that is suitable to allow said coupling and is associated or rigidly coupled at the knee or elbow regions of a preset item of clothing, such as for example a pair of work trousers 15.

[0038] The second and third layers 13 and 14 are therefore provided so that when they mutually overlap the respective contact surfaces are accordingly mutually connected.

[0039] Accordingly, once the user has put on a jersey or jacket or the work trousers 15, said user can place a pair of protection devices 1 at the respective knee or elbow regions, so as to achieve temporary fixing between the second layers 13 and the corresponding third layers 14.

[0040] Each protection device 1 can be disconnected from the respective third layer 14 simply by gripping said protection device 1 by one flap and pulling it away from the third layer 14.

[0041] It has thus been shown that the invention has achieved the intended aim and objects, a knee and/or elbow protection device having been devised which by having a second layer that is detachably associable by overlapping with a third layer that is rigidly coupled to a

preset item of clothing allows not only to achieve optimum protection of the knees and/or elbows of the user but also to be put on rapidly and easily.

[0042] By way of this detachable interconnection between said second and third layers it is therefore possible to avoid the use of conventional fixing straps, so that the protection device thus provided, even if worn for long periods, allows to ensure a high degree of comfort to the user without thereby causing skin irritations, reddening or even blood circulation problems.

[0043] It can also be noted that the protection device, again by way of the method with which the second and third layers are coupled by overlapping, can be positioned stably at the knee and/or elbow regions so that it cannot move or slip even as a consequence of accidental impacts with other objects, for example due to flexing of the legs or arms.

[0044] Moreover, in addition to be reliable over time, the protection device allows the user to apply it and/or remove it simply and rapidly from his item of clothing regardless of the posture or position assumed and without gathering said item of clothing.

[0045] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the same appended claims.

[0046] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be the most pertinent according to specific requirements.

[0047] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0048] The characteristics indicated as advantageous, convenient or the like may also be omitted or replaced by equivalents.

[0049] The disclosures in Italian Utility Model Application No. TV2003U000020 from which this application claims priority are incorporated herein by reference.

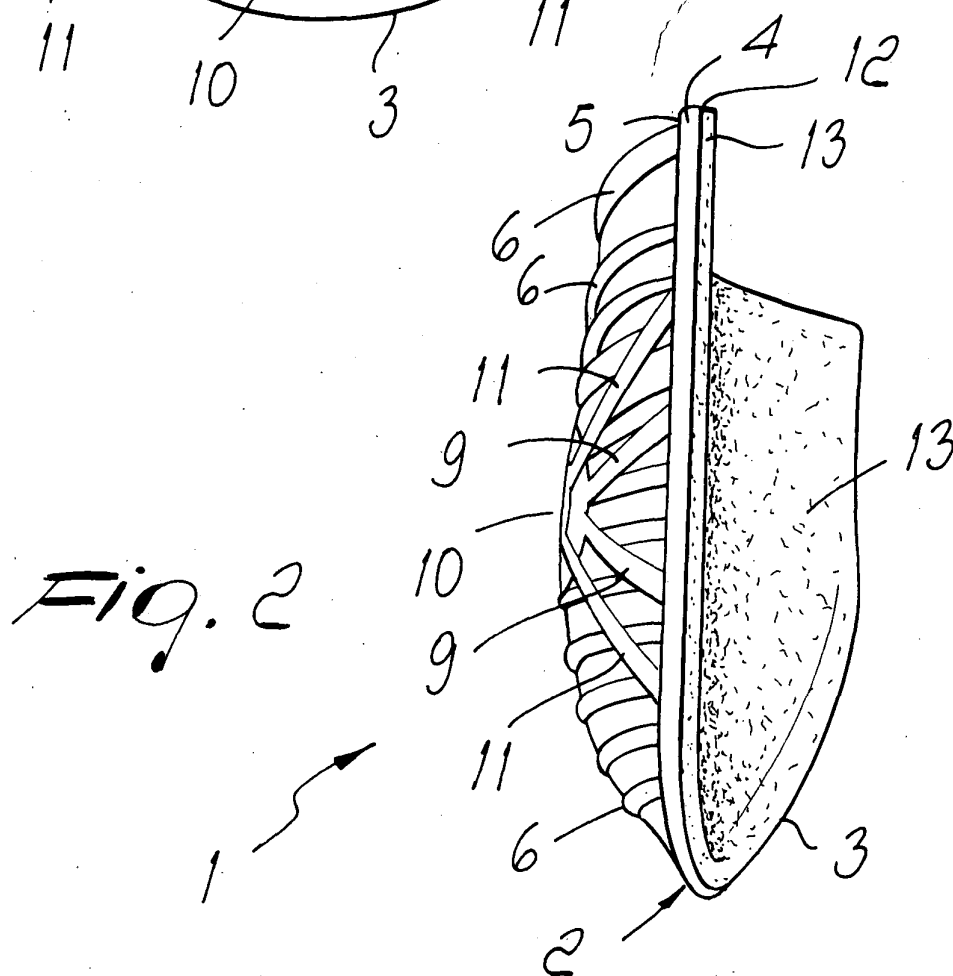
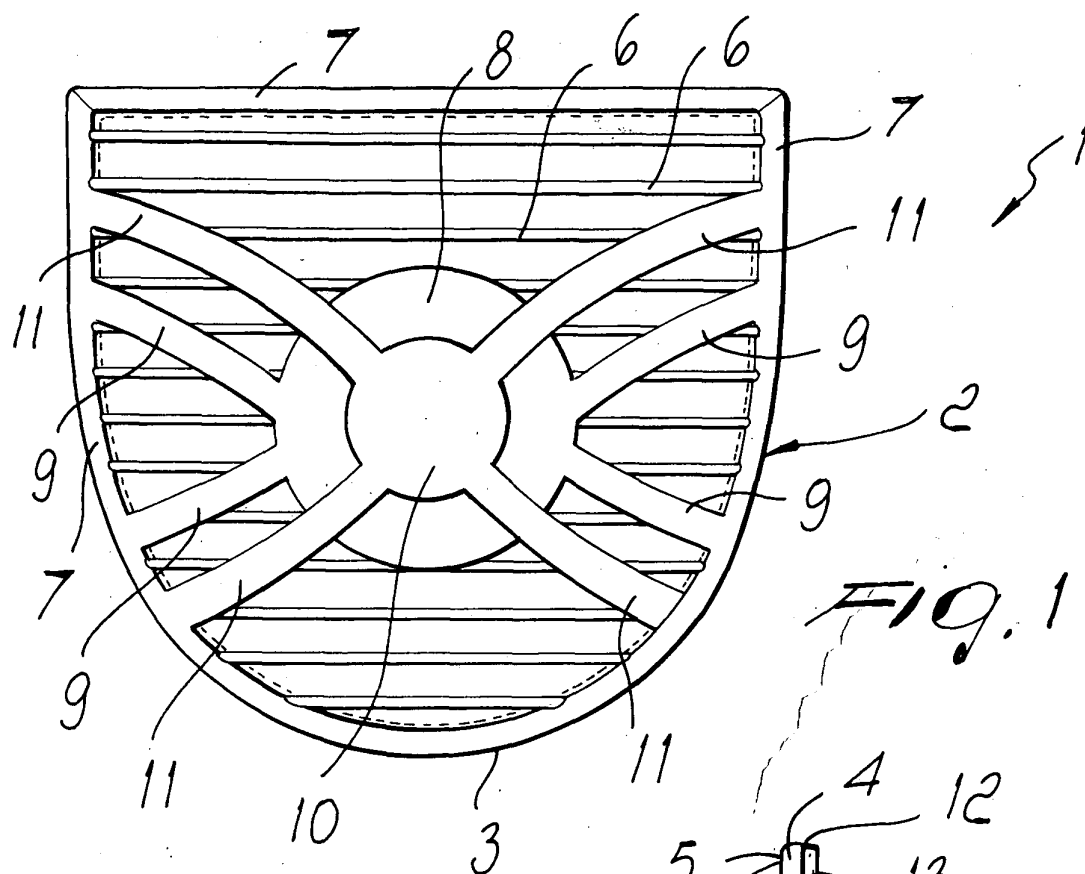
[0050] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A protection device (1) for knees and/or elbows, particularly for use in building yards, **characterized in that** it comprises a shell (2) that has a first layer (4) with which a second layer (13) is associated at the rear, said second layer being detachably associable with a third temporary fixing layer (14) that is associated at the knee or elbow regions of a preset

item of clothing.

2. The device according to claim 1, **characterized in that** said second layer (13) is preferably made of a material known by the trademark Velcro.
3. The device according to claims 1 and 2, **characterized in that** said second layer (13) has, in a plan view, a shape and dimensions that are substantially similar to those of said first layer (4), so that when they overlap their respective perimetric edges mate.
4. The device according to claims 1 and 3, **characterized in that** said third layer (14) is made of a material that allows the detachable coupling thereof to said second layer (13), so that their mutual overlap leads to consequent connection between the respective contact surfaces.



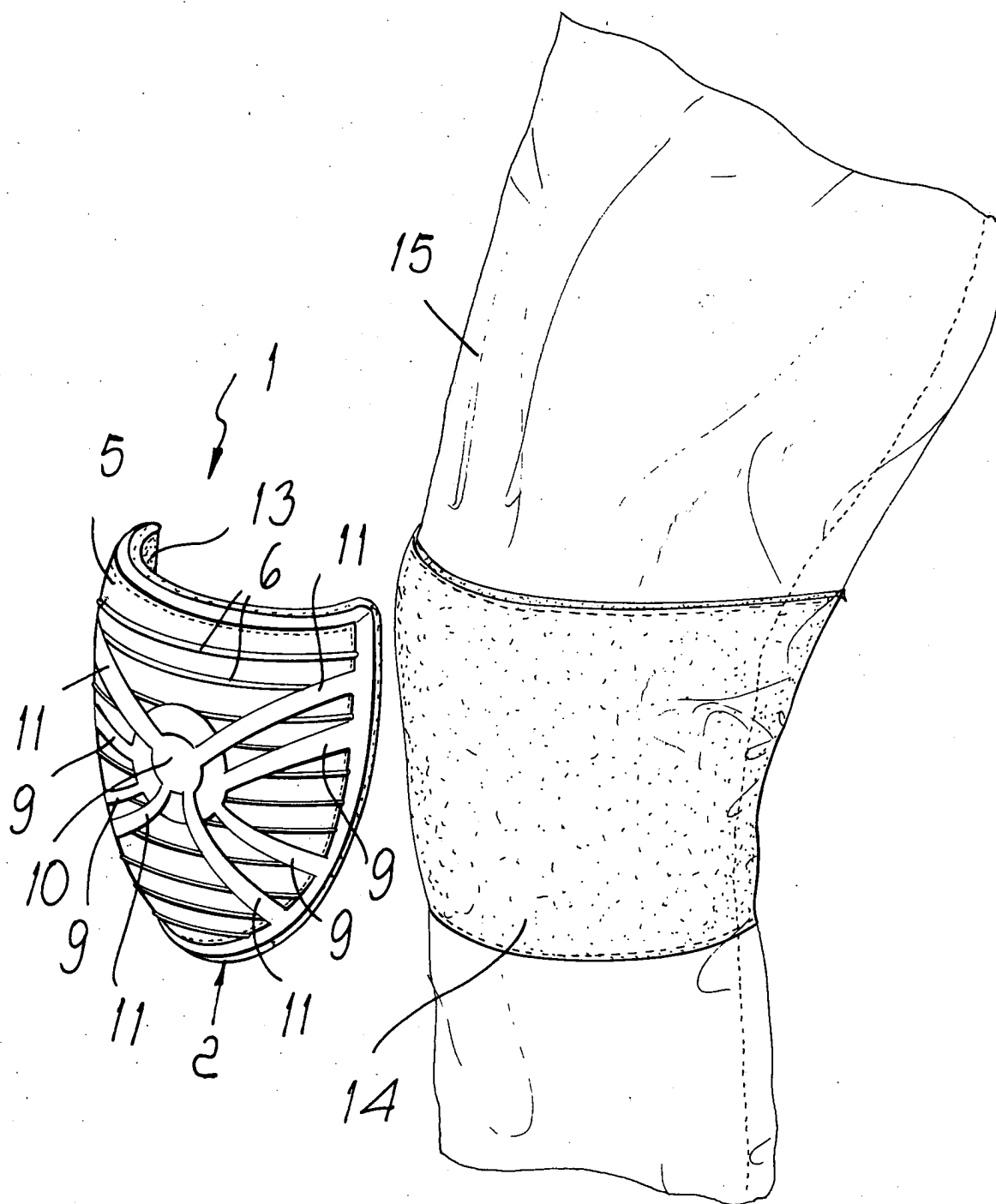


Fig. 3



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 00 9336

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	US 5 732 412 A (HOLDEN KEVIN D) 31 March 1998 (1998-03-31) * column 4, line 64 - column 5, line 55; claims 13,14; figure 3 *	1-4	A41D13/06 A41D13/08
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X	US 5 987 643 A (BEUTLER PARK) 23 November 1999 (1999-11-23) * column 3, line 8 - line 13 * * column 4, line 13 - line 17; figure 6 *	1,2,4	
X	DE 41 37 766 A (NIERHAUS WOLFGANG DIPL KAUFM) 19 May 1993 (1993-05-19) * figures *	1,2,4	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	* column 1, line 33 - line 37 *	2	A41D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 July 2004	Examiner Uhlig, R
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
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EP 04 00 9336

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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