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(54) **Method for creating a punched portion on fabric, leather or the like**

(57) A method for creating a punched region (36) on a flexible plane material, comprising the steps of: a) creating a substantially plane template (40) having a shape corresponding to the shape of said region (36) of flexible material to be punched; b) arranging said template (40) on a part of a conveyor belt (25) of a punching machine

(21) having a beat plate (7); c) arranging a portion (35) of said flexible material above said template (40) in a manner such as to interpose said template (40) between said portion of flexible material (35) and said part of conveyor belt (25); and d) creating said punching at said beat plate (7).

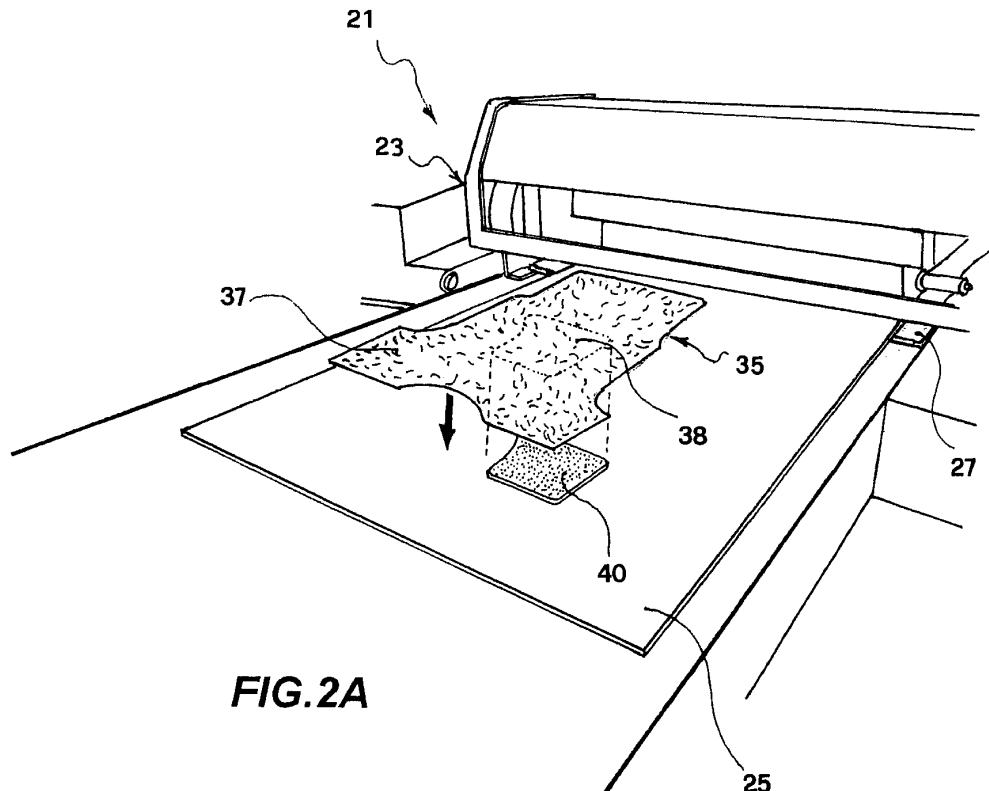


FIG. 2A

Description

[0001] The present invention refers to a method for creating a punched region on a flexible plane material, in particular for creating a punched region limited to a portion of said material.

[0002] While hereinafter particular reference will be made to leather, the same reasoning and findings can likewise apply also to other types of flexible plane material, like e.g. fabric, spunbonded, laminated plastics material or the like.

[0003] Garments, in particular those created with leather parts and for use in the motor biking field, often comprise regions of material suitably punched both to facilitate a user's perspiration and for aesthetical reasons.

[0004] In fact, said garments are often aimed at providing good protection to the user in case of a fall; therefore, owing to the use of leather, fabrics and reinforcements having a certain thickness and compactness, they exhibit features of thermal insulation and impermeability that can prove uncomfortable to a user wearing on the garment, above all in hotter spells or under physical strain conditions.

[0005] In light of the above, the needs to allow both the perspiration of user's produced sweat and a contribution of fresher air inside the garment are typically satisfied by providing suitable garment portions, in particular leather portions, having a plurality of holes so as to allow circulation of a certain amount of air.

[0006] Moreover, a portion of leather on which a plurality of holes has been made according to a preset pattern may also have an aesthetic and ornamental value once the portion itself has been inserted into a garment; e.g., logos, symbols, captions or patterns can be reproduced, thanks to a selective creation of the holes, using a mode that is in harmony with the garment style.

[0007] The known art envisages creating portions of leather punched by means of a punching machine, then sewing them to the other parts of the garment. Said punching machine typically has one or more rows of socket punches that, by moving with a reciprocating motion, punch the portion of leather in motion therebelow.

[0008] Therefore, the leather portions machined by said punching machines are punched in a substantially uniform manner on their entire surface, as the structure and the operation modes of the machine used allow neither to leave out unpunched edges, nor to create said holes according to a pattern different from a uniform punching.

[0009] This is disadvantageous due to various reasons. First of all, seams on punched leather (required in order to join the portion to the remainder of the garment) are remarkably weaker than seams on unpunched leather, and therefore risk breaking when subjected to a stress, thereby prejudicing the user's safety in case of a fall. Evidently, this is due to the fact that the presence of holes reduces the strength of the leather, makes ineffec-

tive part of the stitches and fosters the onset of cuts at said stitches, cuts that can propagate as lacerations.

[0010] Moreover, it is often required that logos or the like be embroidered nearby or at said punched regions; it is common knowledge of those skilled in the art that creating embroideries in punched regions is particularly complex, above all yielding rather low-quality results. Therefore, the known art obliges to create said embroideries on a separate portion of material and to sew the same to the punched portion: in fact, the known art does not allow to create punched regions and unpunched regions on a same piece of leather.

[0011] Lastly, as mentioned hereto, known-art punching machines are unable to selectively punch a portion of leather; hence, it is not possible to reproduce drawings, logos or symbols thereby, via a suitable creating of the holes. To obtain this it would therefore be necessary to cut the required shapes out of a uniformly punched portion and then sew the cut-outs on a portion of unpunched leather. It is evident how this entails a remarkable machining complexity and a great amount of waste material.

[0012] Alternatively, a selective punching can be created by means of a punching machine provided with a plate on which it is fixed a plurality of socket punches arranged according to the pattern to be reproduced. Said plate is then pressed onto the leather portion, thereby concomitantly creating all of the holes required to reproduce the pattern.

[0013] However, even such a system entails several relevant drawbacks. First of all, creating a plate with suitably arranged socket punches requires a remarkable amount of labour and the use of a large number of socket punches, thereby resulting in very high costs. Moreover, a concomitant creating of a large number of holes requires the punching machine to be able to exert a sufficiently high pressure on said plate. This is both limitative for the dimensions and the complexity of the pattern to be created and costly from the installation and energy consumption standpoint.

[0014] Therefore, the present invention stems from the technical problem of providing a method for creating a punched region on a portion of flexible plane material, be it leather, fabric or other, so that said punched region be limited to a predefined zone of said material.

[0015] This is attained by providing a method for creating a punched region on a flexible plane material according to independent claim 1. Secondary features of the present invention are defined in the corresponding dependent claims thereof.

[0016] The present invention provides several relevant advantages. The main advantage lies in that the method of the invention carries out a punching limited to zones predefined on a portion of material, allowing to obtain punched and unpunched parts on a same portion.

[0017] A second advantage lies in allowing to create punching according to patterns predefined on a portion of material.

[0018] Another advantage lies in that the method of

the invention can be adapted to known-art punching machines, allowing a remarkable installation-related, economical and operative saving.

[0019] Yet another advantage lies in that the method of the invention can be carried out in a simple, economical and versatile manner, moreover minimizing the production of waste material.

[0020] Further advantages, features and the operation modes of the present invention will be made evident from the following detailed description of an embodiment thereof, given by way of example and not for limitative purposes. Reference will be made to the figures of the annexed drawings, wherein:

- Figure 1A is a partially sectional perspective view of a punching machine for carrying out a known-art punching method;
- Figure 1B is a portion of material punched according to the method of Figure 1A;
- Figure 2A is a first perspective view referring to the steps of the method of the present invention;
- Figure 2B is a second perspective view referring to the steps of the method of the present invention;
- Figure 3A is a sectional view referring to a step of the method of the present invention;
- Figure 3B is a sectional view referring to another step of the method of the present invention;
- Figure 3C is a sectional view referring to yet another step of the method of the present invention;
- Figure 4 is a plan view of a portion of material punched according to the method of the present invention.

[0021] Figure 1A shows a punching machine 1 substantially known to the art, comprising a plane 2 on which a conveyor belt 5 runs, typically made of a paper carpet. Initially, such a paper carpet is wound in a roll 6 placed below said plane 2, said roll 6 being gradually unwound as the paper carpet is dragged into a main body 3 of said punching machine 1. Thus, a portion of flexible plane material 15 placed on said conveyor belt 5 is it also set in motion, a motion of translation to the main body 3; inside said body 3 there are one or more rows of socket punches having a substantially circular section, moving in a reciprocating motion along their longitudinal axis.

[0022] As it will be better described hereinafter, in a first step of said reciprocating motion said punches come into contact with the material portion 15 and create thereon one or more rows of holes 19, depending of course on the number of said rows of socket punches; in a second step the punches rise from the portion 15 and therefore allow the free advancement thereof. At the next executing of the first step a second set of holes 19 is created, parallel to the first set and at a distance therefrom depending on the feed rate of the conveyor belt 5 and the rate of the reciprocating motion of the punches.

[0023] It will be understood how in the course of said first step the punches arrive substantially into contact with

the conveyor belt 5 and therefore make through holes 19 onto the material portion 15. Moreover, at the punches a beat plate 7 made of metal is placed below the conveyor belt 5 in order to provide a rigid (and optionally replaceable) plate during the punching operation.

[0024] Figure 1B shows said material portion 15 subsequently to the above-described machining. Note that it has rows, parallel thereamong, of holes 19, which are uniformly distributed over the whole surface of the portion 15 itself.

[0025] A method for creating a punched region 36 on a flexible plane material according to the present invention is shown in Figures 2A to 3C, whereas Figure 4 depicts a portion 35 of said material machined according to said method; the portion 35 comprises both said punched region 36 having a plurality of holes 39, and an unpunched region 37. Preferably, said flexible plane material is leather or the like, however the method of the invention may be applied in a substantially identical manner also to a natural-fibre or a synthetic-fibre fabric, a spunbonded or an elasticated fabric, or to a laminated plastics material. Of course, the selection of the material depends on the needs of the subsequent use thereof in creating a garment.

[0026] The method of the invention comprises first of all the step of creating a substantially plane template 40, having shape and dimensions corresponding to shape and dimensions of a region 38 of said flexible plane material to be punched.

[0027] Such a template 40 is conveniently made of cardboard; however it might also be made of hide, leather, plastics material, wood, or metal. Moreover, as it will be made evident hereinafter, in order not to have partial punching or cutting into a region 37 that is not to be punched, the thickness of said template 40 should be greater than or equal to the thickness of said material portion 35.

[0028] The template 40 is arranged on a part of a conveyor belt 25 of a punching machine 21 substantially known to the art, and thereabove the portion 35 of flexible material is arranged, taking care that the region 38 to be punched be at said template 40, which therefore remains interposed between said part of conveyor belt 25 and said portion 35 of flexible material.

[0029] Upon activating the punching machine 21, the conveyor belt 25 brings the portion 35 and the underlying template 40 to a main body 23 of the machine 21, inside which there is a row of socket punches 28 aligned thereamong along a direction transversal with respect to the direction of motion of the conveyor belt 25. Said punches 28 may optionally be arranged on plural parallel rows, instead that on a single row.

[0030] The punches 28 are provided with a moving system that moves them simultaneously, with a reciprocating motion along their longitudinal axis. In a first step, shown in Figure 3B, at a beat plate 27 of the punching machine 21 said punches 28 come into contact with the material portion 35 and punch it, creating a row of holes

39. Note that, due to the thickness introduced by the presence of the template 40, only part of the punches 28 are actually able to proceed with the punching, whereas the remaining punches 28 do not even come into contact with the portion 35, and therefore execute no punching. In a second step, the punches 28 make a reverse motion, returning into the position shown in Figure 3C. The next advancement of the conveyor belt 25 and of the portion 35 is followed by a new carrying out of said first step, during which therefore a second row of holes is made, parallel to the first one. Said steps follow one another until the entire portion 35 has crossed the region of action of the punches 28.

[0031] Note that the minimum relative distance between the punches 28 and the template 40 depends also on the thickness of said beat plate 27, which is placed below the conveyor belt 25 in order to provide a rigid support base during the punching operation. Therefore, the thickness of said plate 27 should be sufficient to allow the punches 28 to punch the region 38 of the fabric portion 35, yet it should not be as high as to cause the punches 28 to be hindered in part of their run by the presence of the plate 27, as the same punches might be damaged.

[0032] Therefore, when wishing to use a known-art punching machine 1, it will be necessary to preliminarily replace a first beat plate 7 with a second beat plate 27 having a thickness substantially equal to the difference between the thickness of said first beat plate 7 and the thickness of said template 40. Thus, at the template 40 the distance between said conveyor belt 25 and the punches 28 is substantially equivalent to that provided for the same punching machine 1 operating according to the known art.

[0033] In light of what has been disclosed in the foregoing, it is evident how said portion 35 will be punched only at the region 38 below which the template 40 lies. Therefore, it is obtained a portion 35 of flexible plane material comprising a punched region 36 and an unpunched region 37.

[0034] However, near the edge of the template 40 the corresponding punch 28 may find a partial or anyhow non-uniform beat plane; therefore, it would produce an incomplete punching of the material, or even merely scratches.

[0035] In this connection, consider that the portion 35, in particular when said flexible plane material is leather, may have a first aesthetic surface and a second non-aesthetic surface, wherein said first aesthetic surface is the one facing outwards and is visible once the portion 35 is inserted into a garment, whereas the second non-aesthetic surface faces inwards of the garment and thus is not visible. Therefore, the first aesthetic surface is the one most machined and finished, which should as much as possible be free from defects and imperfections.

[0036] In order to reduce or eliminate the unpleasant aesthetic effect that the abovementioned incomplete punching would have once the material portion 35 were inserted into a garment, during said step of arranging the

portion 35 above the template 40 it will be adopted the contrivance of placing said aesthetic surface into contact with the template 40. Thus, the aesthetic surface is not exposed as first to the action of the punches 28; therefore, any incomplete punching, scratches or machining defects are produced on the non-aesthetic surface, i.e. the less valuable one that, however, will not be visible after the inserting of the portion 35 into a garment.

[0037] In addition, note that in case the thickness of said template 40 is lower than the thickness of the material portion 35, the punches 28 come into contact with the portion 35 even where the template 40 is not present; yet, by not being able to traverse the entire thickness of the portion 35, they will only make partial punching or cuts.

[0038] From the description of the subject-matter of the present invention, it is evident how it allows to create a limited punched region 36 on a portion 35 of said flexible plane material. In particular, it is possible to obtain a portion 35 having a punched region 36 surrounded by an unpunched region 37. This is advantageous at the joining of said portion 35 with other portions of material, as allowing to perform the required seams and therefore to create seams stronger than those created directly onto the punched region.

[0039] Moreover, it is possible to leave unpunched regions within a punched region, so that embroideries or the like may easily be made in said unpunched regions.

[0040] Lastly, it is possible to create patterns, logos, symbols or other decorative elements by means of punching in a manner much simpler and faster than the known art.

[0041] In all of these cases the template 40 will be cut out, e.g. from a cardboard sheet, according to the shape and dimensions required; of course, said template could be reused plural times for punching a plurality of fabric portions. Therefore, the method subject-matter of the present invention finds advantageous application in industrial production processes. The use of an inexpensive material for the template 40 and the option of using known-art punching machines make it very advantageous, also from an economic standpoint.

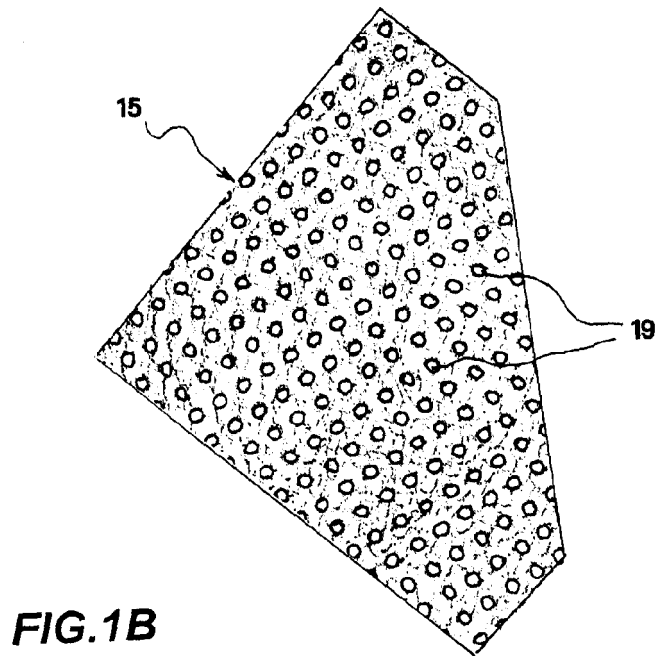
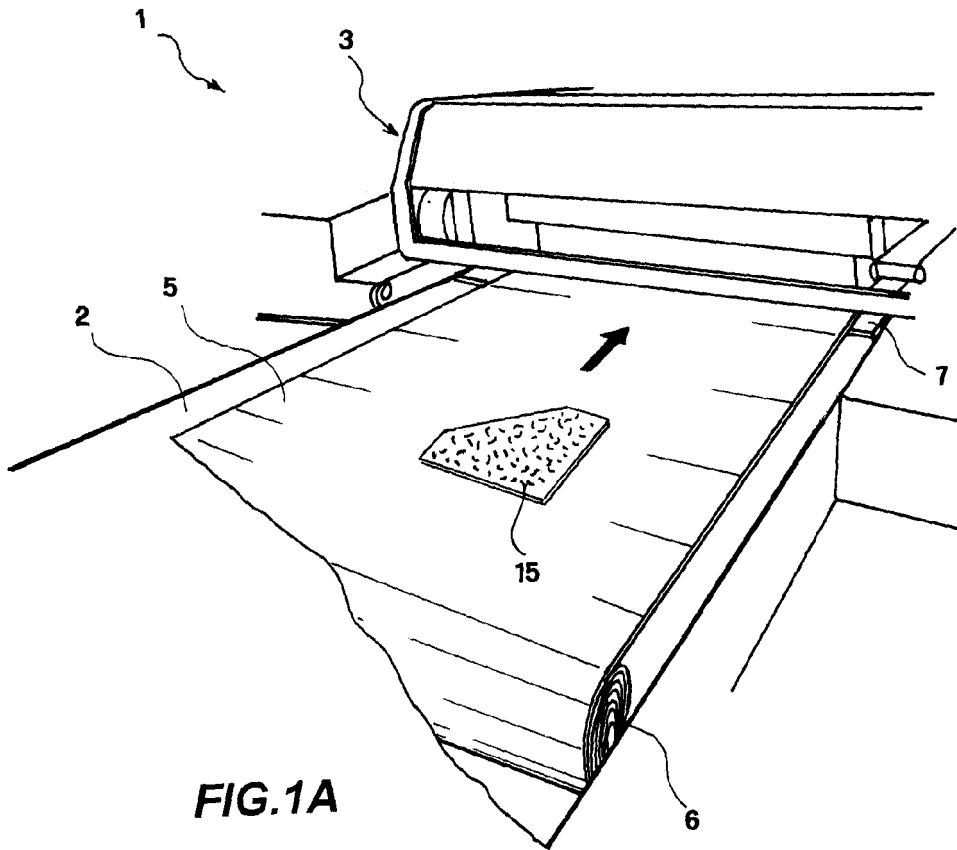
[0042] The portions of punched material thus obtained can usefully be comprised in a garment, in particular for use in sports.

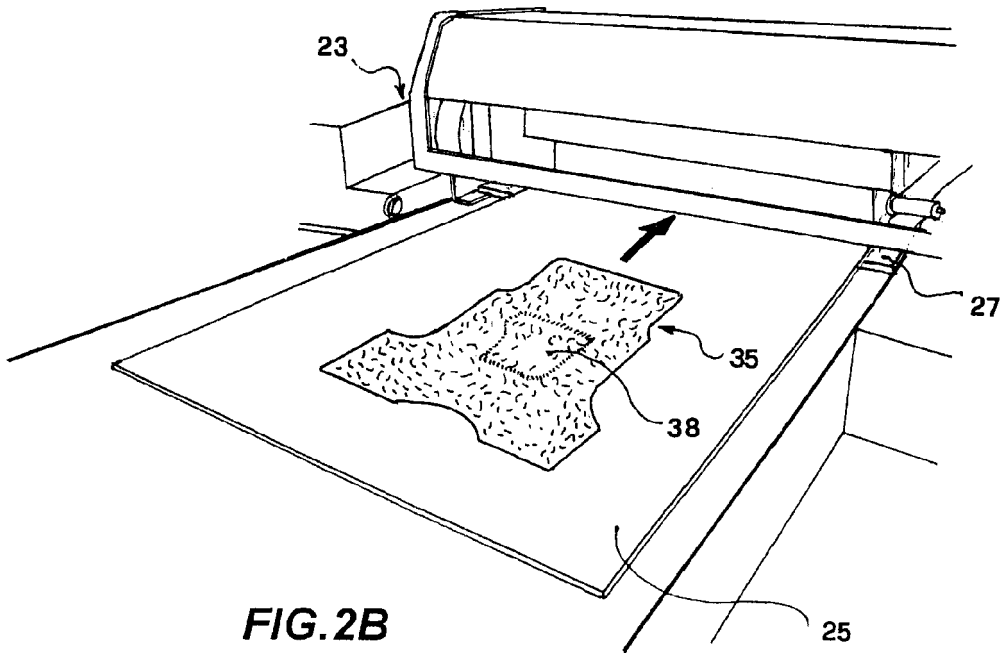
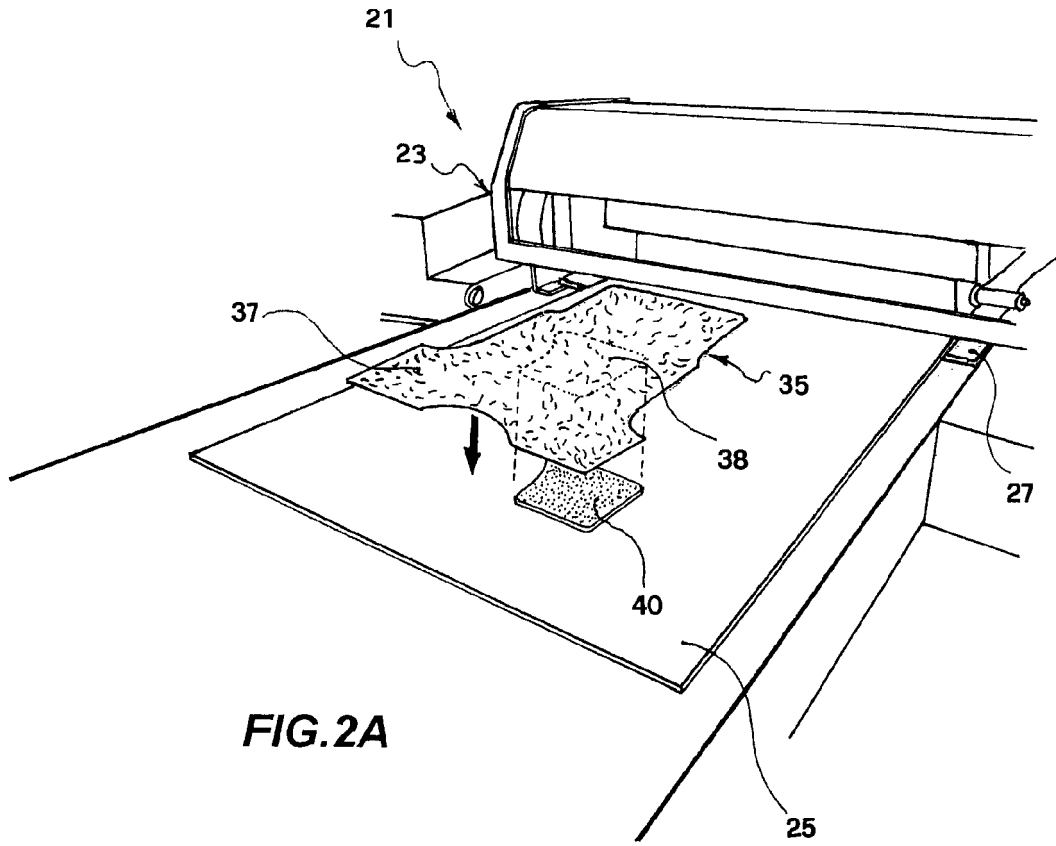
[0043] The present invention has hereto been described with reference to a preferred embodiment thereof. It is understood that other embodiments might exist, all falling within the concept of the same invention, and all comprised within the protective scope of the claims hereinafter.

Claims

1. A method for creating a punched region (36) on a flexible plane material, **characterised in that** it comprises the steps of:

- (a) creating a substantially plane template (40) having a shape corresponding to the shape of said region (36) of flexible material to be punched;
- (b) arranging said template(40) on a part of a conveyor belt (25) of a punching machine (21) having a beat plate (7); 5
- (c) arranging a portion (35) of said flexible material above said template (40) in a manner such as to interpose said template (40) between said portion of flexible material (35) and said part of conveyor belt (25); and 10
- (d) creating said punching at said beat plate (7).
2. The method according to the preceding claim, wherein the thickness of said template (40) is greater than or equal to the thickness of said portion of flexible material (35). 15
3. The method according to any one of the preceding claims, wherein said portion (35) of said flexible material has a first aesthetic surface and a second non-aesthetic surface, and wherein in said step of arranging said flexible material (35) above said template (40) it is provided that said aesthetic surface be into contact with said template (40). 20 25
4. The method according to any one of the preceding claims, wherein said template (40) is made of cardboard. 30
5. The method according to any one of the preceding claims, further comprising the step of replacing said beat plate (7) of said punching machine (1, 21) with a second beat plate (27) having a thickness substantially equal to the difference between the thickness of said first beat plate (7) and the thickness of said template (40). 35
6. A portion (35) of flexible material comprising a punched region (36) created according to the method of any one of the preceding claims. 40
7. The portion (35) of flexible material according to the preceding claim, wherein said flexible material is leather or the like. 45
8. The portion (35) of flexible material according to claim 6, wherein said flexible material is spunbonded or the like. 50
9. The portion (35) of flexible material according to any one of the claims 6 to 8, wherein said punched region (36) is surrounded by an unpunched region (37). 55
10. A garment comprising at least one portion of flexible material (35) according to any one of the claims 6 to 9.





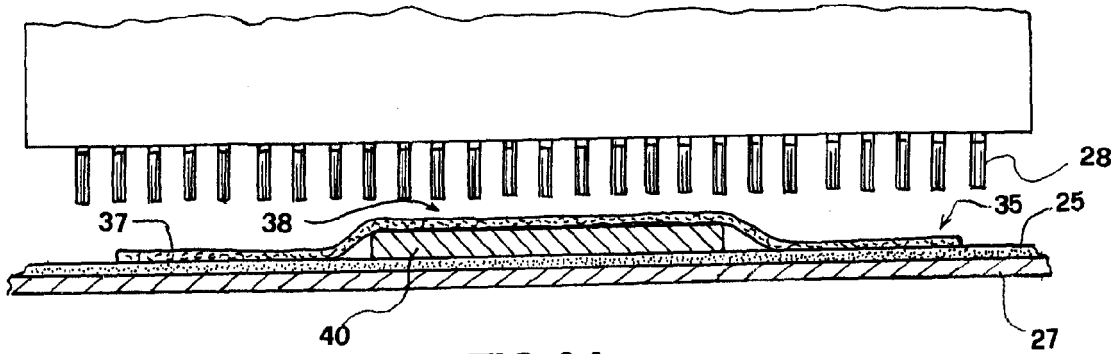


FIG. 3A

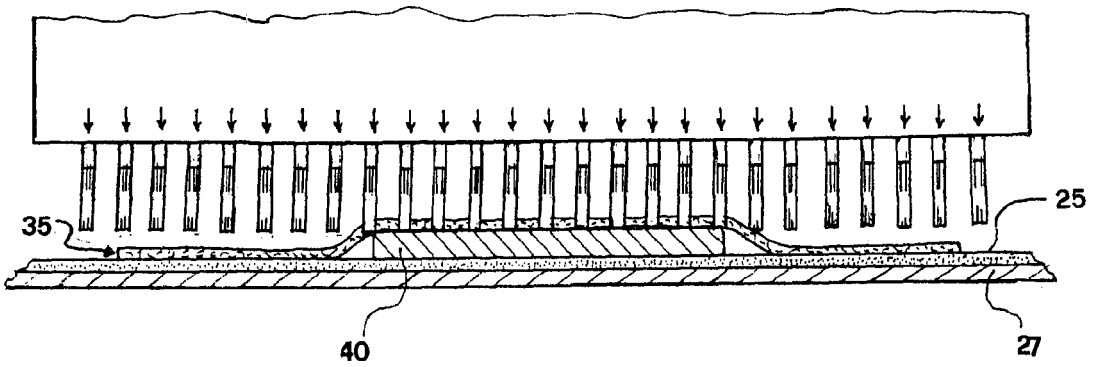


FIG. 3B

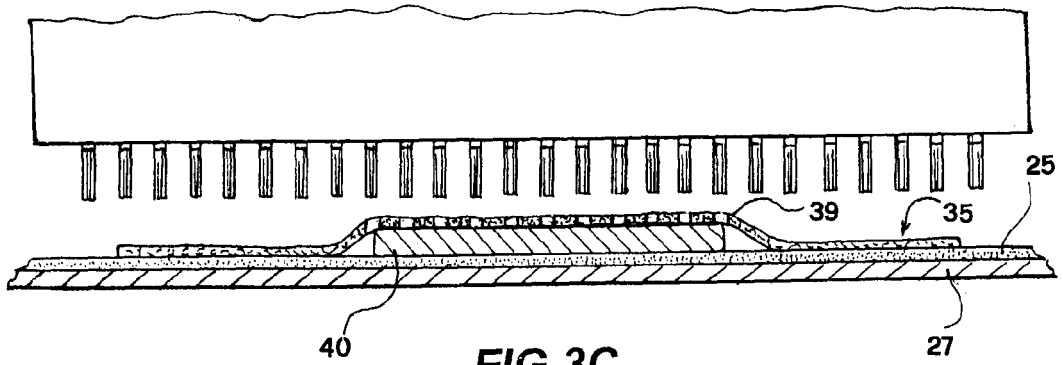


FIG. 3C

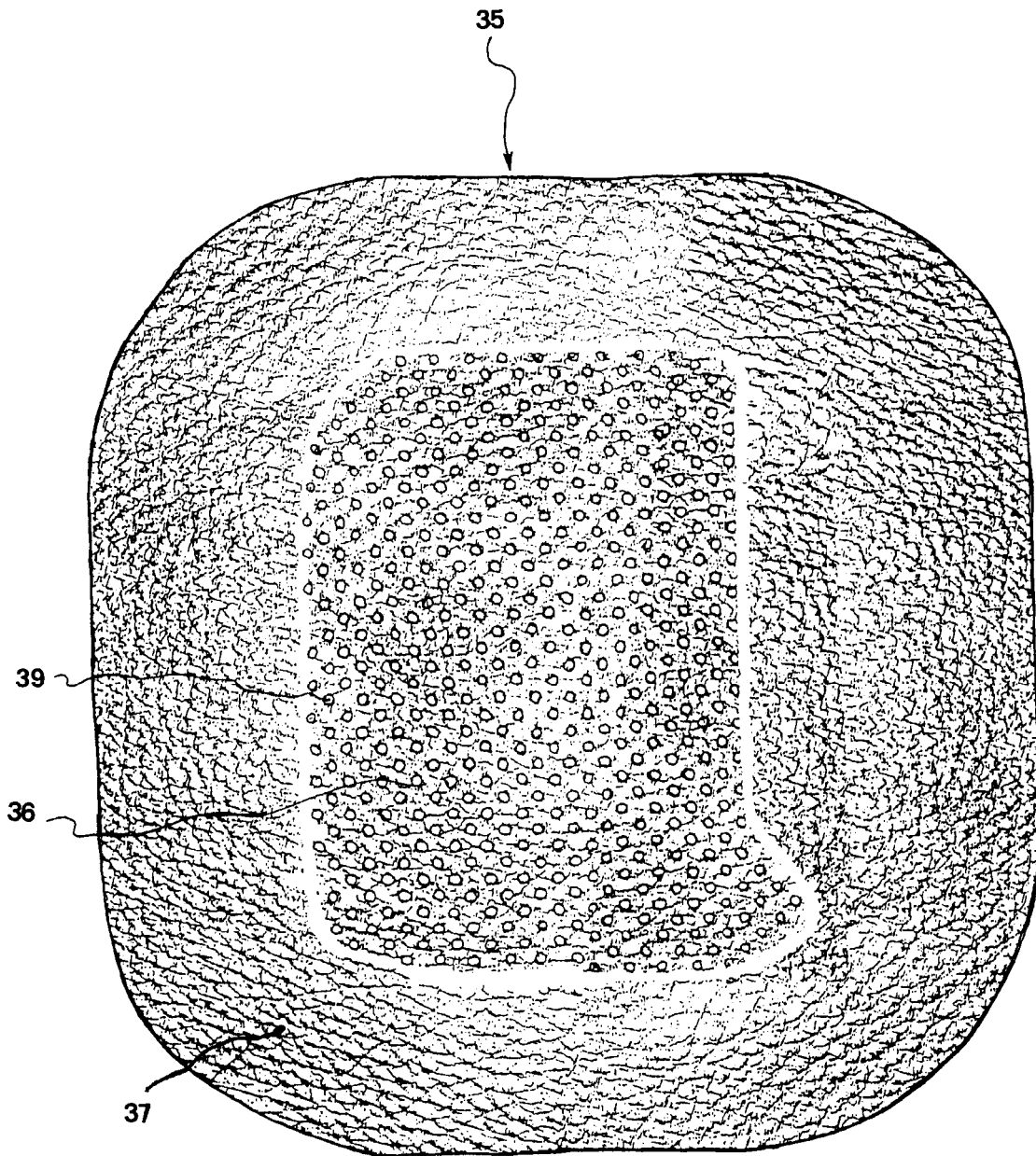


FIG.4



EUROPEAN SEARCH REPORT

Application Number
EP 08 15 8992

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 322 697 A (TECNOFORM S R L [IT]) 5 July 1989 (1989-07-05)	1-5	INV. B26D7/20
X	* column 5, line 3 - line 17; figures * -----	6-9	
X	DE 20 2005 016844 U1 (SCHWARZ JOHANNA [DE]) 12 January 2006 (2006-01-12) * the whole document * -----	6,8-10	
X	US 3 530 748 A (FULLER JUDSON E) 29 September 1970 (1970-09-29) * abstract; figures * -----	6,9	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B26D
Place of search Munich		Date of completion of the search 5 January 2009	Examiner Canelas, Rui
CATEGORY OF CITED DOCUMENTS		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	
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			

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EPO FORM 1503 03.82 (P04C01)

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

EP 08 15 8992

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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05-01-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0322697	A	05-07-1989	IT 1221667 B	12-07-1990

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