

(19) World Intellectual Property Organization
International Bureau



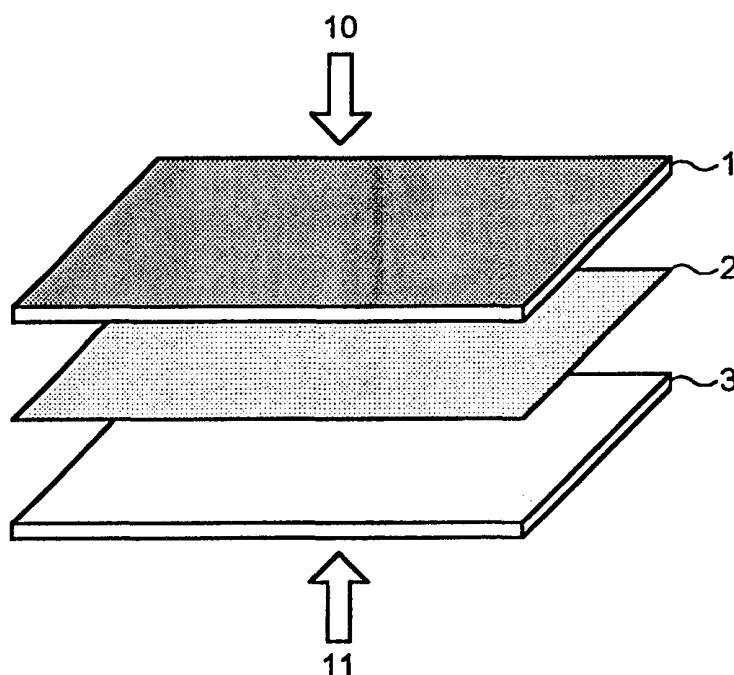
(43) International Publication Date
17 May 2001 (17.05.2001)

PCT

(10) International Publication Number
WO 01/34079 A1

- (51) International Patent Classification⁷: **A61F 13/02**
- (21) International Application Number: PCT/GB00/04300
- (22) International Filing Date:
9 November 2000 (09.11.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
9926632.2 10 November 1999 (10.11.1999) GB
- (71) Applicant (for all designated States except US):
PRO-TEX CAPILLARY DRESSINGS LIMITED
[GB/GB]; Unit 16-17 Bottings Industrial Estate, Botley,
Hampshire SO30 2DY (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **ANCELL, William**
[GB/GB]; 4 Hawthorn Close, Colden Common, Winchester,
SO21 1UX (GB).
- (74) Agent: **TURNER, James, Arthur**; D. Young & Co., 21
New Fetter Lane, London EC4A 1DA (GB).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— With international search report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DRESSING



(57) Abstract: A dressing and a method of manufacturing a dressing. The dressing comprising an absorbent support fabric (2), and a polyester fibre sheet (1) attached to one surface of the absorbent support fabric to provide a wicking path such that exudates contacting an outer surface of the fibre sheet are wicked to the absorbent support fabric. The outer surface of the polyester fibre sheet is heat treated to hinder individual fibres from extending out of the surface and thereby produce a glazed effect. This glazed surface inhibits the dressing from sticking to a wound, and impedes exudate transported within the dressing from returning to the dressing surface.



WO 01/34079 A1

DRESSING

This invention relates to a dressing for transporting exudates and other fluids away from a wound and a method of manufacturing such a dressing.

In the field of wound dressings, for example, with absorbent wound dressings
5 or surgical drains, different types of absorbent fabrics are used to absorb exudates emanating from a wound bed. One of the problems with many absorbent fabrics is that they tend to stick to the wound. This can cause the healing wound to be disturbed on removal of the dressing and furthermore, surface fibres from the dressing may come off and be left in the wound. Another problem is that the absorbed exudate is
10 transported along the fabric and may come into contact with other non-infected parts of the wound that the dressing covers; this can cause infection of these areas.

There is therefore a desire in the field of wound dressings to provide a dressing with a high absorbency and a high rate of transportation of exudate away from a wound bed, while reducing any risk of reinfection of the wound caused by the spreading of
15 exudate across non-infected areas of the wound. There is also a desire to provide a dressing that does not “stick” to the wound, whilst insulating and maintaining a moist environment for the wound.

One known way of addressing the above problems is to use perforated plastic films and laminates between the wound dressing and the wound bed. These films help
20 reduce the adhesion of the dressing and the danger of exudates that are transported within the dressing contacting non-infected parts of the wound bed. These films, have the disadvantage, however, of hindering the absorbency rate of the exudate, as the perforations in the film are not sufficient to maximise absorbency. This may cause the exudate to remain on the wound site for longer. Another drawback with plastic films
25 is that they are often less flexible and not as soft as the absorbent fabric. This can lead to the dressing being uncomfortable or painful when applied to a wound. It can also lead to problems for nursing staff when they try to cut the fabric for the wounds into complicated shapes to cover, for example, mobile joints. The plastic films are also fragile and easily damaged. This can lead to the absorbent fabric contacting the wound
30 directly in certain places, with the risk of reinfection and sticking that this entails.

In accordance with the present invention there is provided a dressing for transporting exudates and other fluids away from a wound, the dressing comprising a plurality of synthetic fibres and an absorbent fabric; wherein the plurality of synthetic fibres are arranged to provide a wicking path from an outer surface of the dressing to a surface of the absorbent fabric, such that fluids contacting the outer surface are wicked away from the outer surface along the synthetic fibres towards the absorbent fabric; and at least a part of the outer surface is heat treated to hinder individual fibres from extending out of that part of the surface, giving a glazed effect to that part of the outer surface.

10 The heat treatment of the synthetic fibres produces a smooth porous surface that facilitates the non-adhesion of the dressing to a wound face. This is due to the glazed surface, which repels cellular attachment during granulation without significantly reducing absorbency of exudate or other fluids. This means that a wound dressing can be changed without compromising the healing of the wound by removing
15 initial granulation. Furthermore, the heat treatment anchors the fibres to the dressing reducing the risk of them becoming detached from the dressing and remaining in the wound when the dressing is removed. Additionally, the glazed finish impedes exudates that are transported within the dressing beneath the glazed surface from returning to the wound face in any significant quantities. The absorbency of the
20 dressing also acts to encourage blood flow to the region and thereby promotes healing.

Although the dressing could be made from many different types of synthetic fibres, in preferred embodiments the synthetic fibres are polyester fibres. Polyester fibres are particularly well adapted, being cheap, easy to manipulate and having good wicking properties.

25 In some embodiments, the absorbent fabric comprises a woven fabric. Woven fabrics are well adapted for mounting synthetic fibres.

In preferred embodiments the absorbent fabric comprises a mixed yarn of between 60% and 70% polyester and 40% and 30% cotton, most preferably substantially 65% polyester and 35% cotton. It has been found that this composition of
30 fabric has surprisingly good absorption properties, being able to absorb up to thirty four times its weight in fluids. Furthermore, this proportion of cotton traps odours

particularly well, while the polyester content acts to wick fluid to the outside edge of the dressing.

Although the fabric may be woven from a variety of different sized threads, threads with an average diameter of 68nm have been found to be particularly
5 appropriate.

Although in some embodiments only a portion of the outer surface is heat treated, in preferred embodiments the whole of the first outer surface is heat-treated.

Preferably, the outer surface is a first outer surface, and the dressing further comprises a plurality of synthetic fibres arranged to provide a wicking path from a
10 second outer surface of the dressing to a further surface of the absorbent fabric, wherein the second outer surface faces away from the first outer surface. This produces a wicking path on the other side of the absorbent fabric to the first wicking path, enabling fluid to pass from the absorbent material along this path to further absorbent materials which may be placed in contact with the second wicking path.

15 In some embodiments the second outer surface is heat treated to hinder the synthetic fibres from extending out of the surface, giving a glazed effect to the second outer surface. Heat treatment of the second outer surface enables sticky tape to be easily removed from this surface without unduly disturbing the dressing.

A preferred density for the substantially planar dressing, giving particularly
20 good absorbency and transport properties, is between 710 and 735 g/m².

In preferred embodiments, the dressing comprises two dressings arranged adjacent to each other such that respective outer surfaces of the two dressings contact each other. This arrangement allows the amount of fluid that the dressing can absorb to be increased.

25 Advantageously, it is the second outer surfaces of the dressings that contact each other. The two dressings contacting each other via the synthetic fibres that are not heat-treated, results in the fluids passing particularly easily between the two dressings.

Advantageously, the thickness of the dressing is between 1 and 4 mm, more
30 preferably, between 3 and 3.5mm. It has been found that this is a particularly

advantageous thickness for the dressing, providing a good absorbency without being too unwieldy.

In some embodiments the dressing is arranged to form a drain, preferably, in the form of a strip between 8 and 15mm wide. The fluid absorption and transporting properties of the dressing make it particularly well adapted as a surgical drain.
5 Furthermore, the fabric structure allows for the original tensile strength to be maintained whilst saturated.

In accordance with a second aspect of the present invention there is provided a dressing for transporting exudates and other fluids away from a wound, the dressing comprising a plurality of synthetic fibres and an absorbent fabric; wherein the plurality
10 of synthetic fibres are arranged to provide a wicking path from an outer surface of the dressing to a surface of the absorbent fabric, such that fluids contacting the outer surface are wicked away from the outer surface along the synthetic fibres towards the absorbent fabric; the absorbent fabric comprising a mixed yarn of between 60% to 70%
15 polyester and 40% to 30% cotton.

It has been found that with the above dressing the synthetic fibres and absorbent dressing have a synergy, acting together to produce excellent absorbent and wicking properties. This composition of absorbent fabric also has a surprisingly good absorbency, holding the absorbed fluid within its structure thereby reducing odours.
20 Furthermore, the absorbent fabric acts in conjunction with the synthetic fibres to wick the fluid away from the wound bed and spread it outwards through the dressing. This helps reduce the wetness of the portion of the dressing contacting the wound bed.

Preferably, the absorbent fabric comprises a mixed yarn of substantially 65% polyester and 35% cotton. This composition of absorbent fabric has surprisingly good
25 absorbency, absorbing up to 34 times its weight in fluid.

In accordance with a third aspect of the present invention there is provided a method of manufacturing a dressing, comprising attaching a plurality of synthetic fibres to one surface of an absorbent central support fabric, such that the synthetic fibres form a wicking path between an outer surface and the absorbent support fabric;
30 and heating at least a part of the outer surface to impede individual fibres from

extending out of that part of the surface, thereby giving a glazed effect to that part of the surface.

In preferred embodiments, the surface is heated to a temperature of between 200 and 250°C. It has been found that this temperature range produces an outer surface with a particularly low “stickiness” whilst still having excellent absorption properties.

The surface may be heat treated in a variety of ways, preferably by passing heated rollers over the surface or with a flame that acts to singe the surface.

In preferred embodiments the synthetic fibres are attached to the absorbent support fabric by pushing the synthetic fibres through the support surface using needle punching. This is a convenient and effective way of producing the dressing.

Embodiments of the present invention will now be described, by way of example only, and with reference to the accompanying drawing, in which:

Figure 1 illustrates a dressing according to an embodiment of the invention.

With reference to Figure 1, a dressing according to an embodiment of the invention is shown, comprising a polyester fibre sheet 1 of directional fibres of varying filament diameters, the sheet having a thickness of 1.7mm. The outer surface 10 is heat treated to produce a “glazed” effect, i.e. the fibres at the surface are bound together by the heat producing a smooth surface out of which individual fibres are hindered from extending.

The polyester fibres are attached to a central support polycotton woven fabric sheet 2, which is 0.2mm thick. They are attached to the central support by conventional needle punching, which produces a felt fabric.

The polycotton support fabric 2 is woven from 65% polyester and 35% cotton threads to give a density of 90 ends and 65 picks after scouring. Apart from the scouring (washing) after weaving, the support fabric will have no additional dying or processing. The scouring process removes residues thereby reducing optical brilliance and contamination in the final dressing and diminishing the risk of any allergic reaction to the dressing. The weight after scouring of the planar dressing is between 120 and 95 g/m². The cotton content of the support surface holds the fluid in a

concentration in the middle of the dressing causing the outer surfaces of the dressing to remain damp rather than wet and reducing any odours emanating from the dressing.

In the embodiment illustrated a polyester fibre sheet 3 consisting of directional fibres is attached to the other side of the woven fabric sheet 2. This polyester fibre sheet 3 is also attached by needle punching and is 1.7mm thick. In this embodiment the surface 11 of the sheet 3 is not heat-treated and thus has no glazed finish.

Strike through, whereby exudates come through the dressing, is prevented or diminished by the glazed layer, in conjunction with the polycotton support surface. This combination also acts to encourage the rapid wicking of fluid between the glazed and absorbent support surface by capillary action towards the outside edge of the dressing fabric. This wicking effect is further enhanced by the glazed surface not adhering to the wound or becoming saturated.

The dressing illustrated may be used in conjunction with a similar dressing to form a composite dressing. The two unglazed surfaces are placed together, such that fluids absorbed into the dressing that contacts the wound bed pass from this dressing via the polyester fibres to the second dressing. This substantially increases the quantity of fluid that the dressing can absorb.

In further embodiments, not shown, the polyester fibre sheet 3 may be omitted. Omitting this sheet gives a thinner dressing, which can therefore be more easily manipulated. It has been found that this sort of dressing is particularly well adapted for veterinary and in particular, equestrian use. The bandaging of horse's legs requires a dressing that is very flexible and can bend to the shape of the leg.

In other embodiments, not shown, the second outer surface 11 may also be heat-treated. The advantage of this is that it facilitates the removal of adhesive tapes that bind the dressing to the patient or to other dressings, and thus limits any disturbance caused to the dressing.

In other embodiments, neither side of the surgical dressing is heat glazed. In these embodiments the absorbent fabric comprises a mixed yarn of between 60 to 70 % polyester and 40 to 30% cotton, most preferably 65% polyester and 35% cotton. Other properties of the dressing are the same as for the embodiments described above.

The dressing may also be used as a surgical drain. The draining action of the fabric is achieved by cutting the dressing to size depending upon the depth of the wound bed. A typical draining strip is 10mm in width. The length is dependent on the distance over which the exudate or fluid needs to be transported. One end of the drain
5 is held in the wound and the other end drain is received in a collection device or bag. The drain attaches to a dressing or absorbent device by weaving in and out of slots cut in the dressing or device. The fabric has the advantage of wicking fluid vertically whilst the outer surfaces of the fabric remain comparatively dry.

In some embodiments the drain may have both surfaces heat glazed. Heat
10 glazing both sides enables adhesive tape that may be used to secure, for example, a stoma bag to the patient's wound to be removed easily. This means that the bag can be changed without disturbing the drain.

This method of removing exudate or other fluids from a cavity wound or sinus provides for healing within the wound bed. The fabric structure of the dressing is such
15 that it allows for the original tensile strength to be maintained whilst saturated.

The drain may also be used to divert exudate from a sinus away from an existing wound face, thereby reducing the risk of reinfection from the sinus channel. This is achieved by inserting the dressing cut to form a drain and with a tapered end directly into the cavity or sinus channel, and bending the drain in the direction of a
20 collection bag.

The dressing according to embodiments of the invention may be used for a variety of wounds including chronically infected wounds, exudating wounds, venous ulcers, pressure ulcers, burns, tears, both in humans and animals. They are particularly appropriate for venous ulcers as they can be bound tightly to produce a degree of
25 compression without sticking to the wound. They may also be used to hold hydrogels, used to rehydrate wounds, in place. It has been found that the glazed surface of the dressing has a low absorption of the dense hydrogel, while absorbing the exudates well.

CLAIMS

1. A dressing for transporting exudates and other fluids away from a wound, the dressing comprising a plurality of synthetic fibres and an absorbent fabric;
5 wherein
the plurality of synthetic fibres are arranged to provide a wicking path from an outer surface of the dressing to a surface of the absorbent fabric, such that fluids contacting the outer surface are wicked away from the outer surface along the synthetic fibres towards the absorbent fabric; and
10 at least a part of the outer surface is heat treated to hinder individual fibres from extending out of that part of the surface, giving a glazed effect to that part of the outer surface.
2. A dressing according to claim 1, wherein the synthetic fibres are
15 polyester fibres.
3. A dressing according to any one of the preceding claims, wherein the absorbent fabric comprises a woven fabric.
- 20 4. A dressing according to any one of the preceding claims, wherein the absorbent fabric comprises a mixed yarn of between 60% to 70% polyester and 40% to 30% cotton.
- 25 5. A dressing according to any one of the preceding claims, wherein the absorbent fabric comprises a mixed yarn of substantially 65% polyester and 35% cotton.
6. A dressing according to any one claims 3 to 5, wherein the absorbent fabric is woven from threads having an average diameter of 68nm.

30

7. A dressing according to any one of the preceding claims, wherein the whole of the outer surface is heat-treated.

8. A dressing according to any one of the preceding claims, wherein the
5 outer surface is a first outer surface, and the dressing further comprises a plurality of synthetic fibres arranged to provide a wicking path from a second outer surface of the dressing to a further surface of the absorbent fabric, wherein the second outer surface faces away from the first outer surface.

10 9. A dressing according to claim 8, wherein at least a portion of the second outer surface is heat-treated to hinder the synthetic fibres from extending out of the surface, giving a glazed effect to the second outer surface.

10. A dressing according to any one of claims 8 to 9, wherein the dressing
15 is substantially planar and has a density of between 710 and 735 g/m².

11. A dressing comprising two dressings according to any one of claims 8 to 10, the dressings being arranged adjacent to each other such that respective outer surfaces of the two dressings contact each other.

20

12. A dressing according to claim 11, the two dressings being arranged such that the second outer surfaces of the two dressings contact each other.

13. A dressing according to any one of the preceding claims, wherein the
25 thickness of the dressing is between 1 and 4 mm.

14. A dressing according to claim 13, wherein the thickness of the dressing is between 3 and 3.5mm.

30 15. A dressing according to any one of claims 1 to 10, wherein the dressing is arranged to act as a drain.

16. A dressing according to claim 15, wherein the absorbent fabric and synthetic fibres form a strip substantially 10mm wide.

5 17. A dressing for transporting exudates and other fluids away from a wound, the dressing comprising a plurality of synthetic fibres and an absorbent fabric; wherein
the plurality of synthetic fibres are arranged to provide a wicking path from an outer surface of the dressing to a surface of the absorbent fabric, such that fluids contacting
10 the outer surface are wicked away from the outer surface along the synthetic fibres towards the absorbent fabric;
the absorbent fabric comprising a mixed yarn of between 60% to 70% polyester and 40% to 30% cotton.

15 18. A dressing according to claim 17, wherein the absorbent fabric comprises a mixed yarn of substantially 65% polyester and 35% cotton.

19. A method of manufacturing a dressing, the method comprising attaching a plurality of synthetic fibres to one surface of an absorbent central support
20 fabric, such that the synthetic fibres form a wicking path between an outer surface and the absorbent support fabric; heating at least a part of the outer surface to impede individual fibres from extending out of that part of the surface, giving a glazed effect to that part of the surface.

25 20. A method of manufacturing a dressing according to claim 19, the heating step comprising heating the at least a part of the outer surface to a temperature between 200 and 250°C.

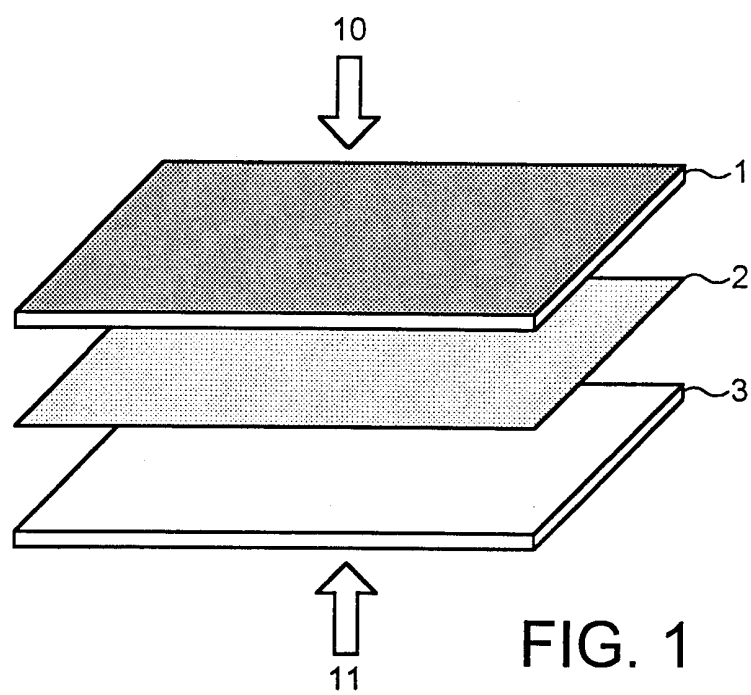
21. A manufacturing method according to claim 19 or 20, the heating step
30 comprising passing heated rollers over the at least a part of the outer surface to heat that part of the outer surface.

22. A manufacturing method according to claim 19 or 20, the heating step comprising heat-treating the at least a part of the outer surface by singeing it with a flame.

5

23. A manufacturing method according to any one of claims 19 to 22, the attaching step comprising pushing the synthetic fibres through the support surface using needle punching to attach them to the absorbent support fabric.

1 / 1



INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/04300

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61F13/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 130 857 A (HUYCK CORPORATION) 16 October 1968 (1968-10-16) the whole document	1,3,7-9, 19-23
P,X	US 6 103 951 A (FREEMAN FRANK) 15 August 2000 (2000-08-15) claims; figures	1,2,7, 19,21,22
X	GB 1 242 717 A (CARL FREUDENBERG) 11 August 1971 (1971-08-11) the whole document	1,3, 19-21
X A	US 4 211 227 A (HOWEY JON A ET AL) 8 July 1980 (1980-07-08) the whole document	1,2,8,9, 15,19-21 4,5,10, 13,14, 17,18
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *G* document member of the same patent family

Date of the actual completion of the international search

12 February 2001

Date of mailing of the international search report

22/02/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Douskas, K

INTERNATIONAL SEARCH REPORT

Inter. Jnal Application No
PCT/GB 00/04300

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 070 164 A (CHICOPEE) 19 January 1983 (1983-01-19) the whole document ----	1,2,7-9, 19-22
X	WO 84 03833 A (SANETTA TEXTIL AB) 11 October 1984 (1984-10-11) the whole document ----	1,2, 19-21
X	US 4 219 019 A (COATES JOHN T) 26 August 1980 (1980-08-26) the whole document ----	1,2,7-9, 19,21
X	EP 0 171 807 A (CHICOPEE) 19 February 1986 (1986-02-19) the whole document ----	1,2,7-9, 19,21
X	US 4 622 089 A (LAURITZEN NELS J) 11 November 1986 (1986-11-11) the whole document -----	1,2,7, 19,21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/04300

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1130857	A	NONE	
US 6103951	A	15-08-2000	NONE
GB 1242717	A	11-08-1971	DE 1642025 A 16-06-1971
US 4211227	A	08-07-1980	AR 218106 A 15-05-1980 AU 522943 B 01-07-1982 AU 4641579 A 10-01-1980 BE 877419 A 05-11-1979 BR 7904151 A 18-03-1980 CA 1122509 A 27-04-1982 CH 638394 A 30-09-1983 DE 2923847 A 17-01-1980 ES 253805 Y 16-09-1981 FR 2430222 A 01-02-1980 GB 2024709 A,B 16-01-1980 HK 41582 A 01-10-1982 IT 1118163 B 24-02-1986 JP 1449903 C 11-07-1988 JP 55010992 A 25-01-1980 JP 62057348 B 30-11-1987 MX 151084 A 27-09-1984 NL 7904700 A,C 07-01-1980 NZ 190300 A 19-12-1980 SE 440024 B 15-07-1985 SE 7905633 A 04-01-1980 ZA 7902228 A 28-05-1980
EP 0070164	A	19-01-1983	AT 22473 T 15-10-1986 AU 557493 B 24-12-1986 AU 8568682 A 13-01-1983 BR 8204018 A 05-07-1983 CA 1186571 A 07-05-1985 DE 3273449 D 30-10-1986 IN 157073 A 11-01-1986 IN 159175 A 04-04-1987 MX 157889 A 19-12-1988 NZ 201073 A 13-12-1985 ZA 8204926 A 29-02-1984
WO 8403833	A	11-10-1984	CA 1216703 A 20-01-1987 EP 0138982 A 02-05-1985 IT 1173620 B 24-06-1987 SE 8301783 A 01-10-1984
US 4219019	A	26-08-1980	CA 1127489 A 13-07-1982
EP 0171807	A	19-02-1986	AT 84083 T 15-01-1993 AU 576618 B 01-09-1988 AU 4624385 A 20-02-1986 BR 8503891 A 27-05-1986 DE 3586931 A 11-02-1993 DE 3586931 T 29-04-1993 NZ 212999 A 29-05-1987 ZA 8506209 A 25-03-1987
US 4622089	A	11-11-1986	AT 42192 T 15-05-1989

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte. onal Application No

PCT/GB 00/04300

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4622089 A		AU 579993 B	22-12-1988
		AU 2509684 A	06-09-1984
		BR 8400902 A	02-10-1984
		CA 1226189 A	01-09-1987
		DE 3477731 D	24-05-1989
		DK 107184 A	29-08-1984
		EP 0120612 A	03-10-1984
		FI 840782 A	29-08-1984
		GB 2135583 A, B	05-09-1984
		HK 9987 A	06-02-1987
		IE 56064 B	10-04-1991
		JP 1767857 C	11-06-1993
		JP 4051178 B	18-08-1992
		JP 59171550 A	28-09-1984
		KR 9100852 B	11-02-1991
		MY 36987 A	31-12-1987
		NO 840738 A	29-08-1984
		NZ 207147 A	31-08-1987
		PH 21067 A	10-07-1987