Title (en)

Filament tuft absorbent by capillary action

Title (de)

Durch Kapillarwirkung saugfähiges Bündel von Borstenfilamenten

Title (fr)

Touffe de filaments absorbant par capillarité

Publication

EP 1021971 A1 20000726 (DE)

Application

EP 99124358 A 19991207

Priority

- DE 19859403 A 19981222
- DE 19947459 A 19991002

Abstract (en)

The frame (9) is injected onto the outer bristles (6), partly penetrating into their interstices. An independent claim is included for the corresponding method of absorbent brush manufacture. A special feature is adjustment of the force holding the fine bristle bundle (7) together during injection molding, to control bundle capillarity. In addition, a corresponding pressure injection mold is claimed. Preferred features: The frame is injected-on, leaving free bristle length on both sides. The frame is an integral annular body. It is pretensioned, holding the bristles together. Tension differs between opposite sides of the frame. Bristles are plastic, outer ones being melted into the frame. They are joined, e.g. adhered, clamped, welded or pressure-injected with plastic, at the end face of the bundle. Bristle filaments are 10-300 mu m in diameter. The frame is integrally-connected to another component, e.g. a tank. Frame and bundle-separating transverse strips are made integrally by injection molding. Salient features of the process, include capillarity adjustment by bundle compression, a function of the injection pressure. Plungers in the mold, are used for bundle compression. Capillarity varies over bundle length. Plungers are subjected to spring-loading, hydraulic- or pneumatic force under independent control, working in a different direction to mold closure.

Abstract (de)

Die Erfindung betrifft ein, durch Kapillarwirkung saugfähiges Bündel (6) von Borstenfilamenten (7), welche Borstenfilamente (7) durch ein Rahmenteil (9) zusammengefaßt sind. Um ein durch Kapillarwirkung saugfähiges Bündel von Borstenfilamenten der in Rede stehenden Art verbessert auszubilden derart, daß eine einfache und prozeßsichere Halterung und Abdichtung der Borstenfilamente gegeben ist, wird vorgeschlagen, daß das Rahmenteil (9) unter teilweisem Eindringen in Zwischenbereiche (10) von Außen-Borstenfilamenten (7') an die Borstenfilamente (7) im Kunststoffspritzverfahren angespritzt ist. <IMAGE>

IPC 1-7 (main, further and additional classification)

A46B 3/10

IPC 8 full level (invention and additional information)

A46B 3/10 (2006.01)

CPC (invention and additional information)

A46B 3/10 (2013.01)

Citation (search report)

- [A] EP 0300637 A1 19890125 - VAX APPLIANCES LTD [GB]
- [A] US 5702194 A 19971230 - HSU SHIH HSIUNG [TW]
- [A] EP 0097322 A2 19840104 - KELEMEN LASZLO

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

EPO simple patent family

EP 1021971 A1 20000726; EP 1021971 B1 20031008; EP 1021971 B9 20040128; AT 251405 T 20031015; PT 1021971 E 20040430

INPADOC legal status

2014-10-31 [PG25 DE] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO

- Ref Country Code : DE
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20140701

2014-10-16 [REG DE R119] APPLICATION DEEMED WITHDRAWN, OR IP RIGHT LAPSED, DUE TO NON-PAYMENT OF RENEWAL FEE

- Document : DE 59907281
- Effective date : 20140701

2014-07-01 [REG DE R119] APPLICATION DEEMED WITHDRAWN, OR IP RIGHT LAPSED, DUE TO NON-PAYMENT OF RENEWAL FEE

- Document : DE 59907281

2013-04-30 [PG25 FR] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO

- Ref Country Code : FR
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20120102

2013-04-30 [PGFP DE] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE

- Ref Country Code : DE

- Payment date : 20121221
- Year of fee payment : 14

2013-01-31 [PG25 AT] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : AT
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20111207

2012-12-15 [REG AT MM01] LAPSE BECAUSE OF NOT PAYING ANNUAL FEES
- Document : AT 251405 T
- Effective date : 20111207

2012-09-07 [REG FR ST] NOTIFICATION OF LAPSE
- Effective date : 20120831

2012-08-31 [PG25 PT] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : PT
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20120608

2012-06-19 [REG PT MM4A] ANNULMENT/LAPSE DUE TO NON-PAYMENT OF FEES, SEARCHED AND EXAMINED PATENT
- Free text : LAPSE DUE TO NON-PAYMENT OF FEES
- Effective date : 20120608

2011-02-28 [PGFP PT] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : PT
- Payment date : 20101117
- Year of fee payment : 12

2011-01-31 [PGFP AT] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : AT
- Payment date : 20101203
- Year of fee payment : 12

2011-01-31 [PGFP FR] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : FR
- Payment date : 20101209
- Year of fee payment : 12

2010-06-04 [REG FR TP] TRANSMISSION OF PROPERTY

2007-07-13 [REG HK WD] APPLICATIONS WITHDRAWN, DEEMED TO BE WITHDRAWN, OR REFUSED AFTER PUBLICATION IN HONG KONG
- Document : HK 1029720

2006-07-31 [REG PT PC4A] TRANSFER OF ASSIGNMENT
- Owner name : IGLSEDER, HEINRICH DR., DE
- Effective date : 20060530

2005-06-15 [REG CH PL] PATENT CEASED

2004-09-29 [26N] NO OPPOSITION FILED
- Effective date : 20040709

2004-08-25 [GBPC] GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE
- Effective date : 20040108

2004-06-30 [BERE] BE: LAPSED
- Owner name : *VORWERK & CO. INTERHOLDING G.M.B.H.
- Effective date : 20031231

2004-06-30 [REG IE FD4D] EUROPEAN PATENTS DESIGNATING IRELAND TREATED AS ALWAYS HAVING BEEN VOID

2004-05-28 [ET] FR: TRANSLATION FILED

2004-04-30 [REG PT SC4A] TRANSLATION IS AVAILABLE
- Free text : AVAILABILITY OF NATIONAL TRANSLATION
- Effective date : 20040210

2004-03-01 [NLV1] NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT

2004-01-19 [PG25 ES] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO

- Ref Country Code : ES
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20040119

2004-01-08 [PG25 GB] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : GB
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20040108

2004-01-08 [PG25 DK] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : DK
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20040108

2004-01-08 [PG25 GR] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : GR
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20040108

2004-01-08 [PG25 SE] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : SE
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20040108

2003-12-31 [PG25 BE] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : BE
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20031231

2003-12-31 [PG25 CH] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : CH
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20031231

2003-12-31 [PG25 LI] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : LI
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20031231

2003-12-31 [PG25 MC] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : MC
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20031231

2003-12-07 [PG25 LU] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : LU
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20031207

2003-12-07 [PG25 CY] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : CY
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20031207

2003-11-14 [REG CH NV] NEW AGENT
- Representative's name : PATMED AG

2003-11-13 [REF] CORRESPONDS TO:
- Document : DE 59907281 P 20031113

2003-11-12 [REG IE FG4D] EUROPEAN PATENTS GRANTED DESIGNATING IRELAND
- Free text : GERMAN

2003-10-29 [GBT] GB: TRANSLATION OF EP PATENT FILED (GB SECTION 77(6)(A)/1977)
- Effective date : 20031008

2003-10-15 [REG CH EP] ENTRY IN THE NATIONAL PHASE

2003-10-08 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : B1
- Designated State(s) : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

2003-10-08 [REG GB FG4D] EUROPEAN PATENT GRANTED
- Free text : NOT ENGLISH

2003-10-08 [PG25 FI] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : FI
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20031008

2003-10-08 [PG25 IE] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : IE
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20031008

2003-10-08 [PG25 IT] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : IT
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20031008

2003-10-08 [PG25 NL] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : NL
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20031008

2002-10-09 [17Q] FIRST EXAMINATION REPORT
- Effective date : 20020822

2001-04-11 [AKX] PAYMENT OF DESIGNATION FEES
- Free text : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

2000-07-26 [17P] REQUEST FOR EXAMINATION FILED
- Effective date : 20000510

2000-07-26 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : A1
- Designated State(s) : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

2000-07-26 [AX] REQUEST FOR EXTENSION OF THE EUROPEAN PATENT TO:
- Free text : AL;LT;LV;MK;RO;SI