

(51) International Patent Classification ⁶ : B24D 13/14, 13/20	A1	(11) International Publication Number: WO 96/27480
		(43) International Publication Date: 12 September 1996 (12.09.96)

(21) **International Application Number:** PCT/GB96/00482

(22) **International Filing Date:** 1 March 1996 (01.03.96)

(30) **Priority Data:**
9504317.0 3 March 1995 (03.03.95) GB

(71) **Applicant** (*for all designated States except US*): FARECLA PRODUCTS LIMITED [GB/GB]; Broadmeads, Ware, Hertfordshire SG12 9HS (GB).

(72) **Inventor; and**

(75) **Inventor/Applicant** (*for US only*): EAMES, Stuart, Paul [GB/GB]; 112 Duncombe Road, Bengoe, Hertford SG14 3DA (GB).

(74) **Agent:** HITCHCOCK, Esmond, Antony; Lloyd Wise, Tregear & Co., Commonwealth House, 1-19 New Oxford Street, London WC1A 1LW (GB).

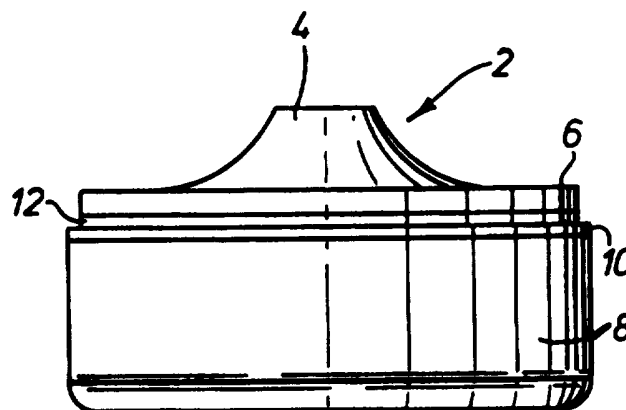
(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: APPLICATOR HEAD

(57) Abstract

An applicator head comprises a pad (20) and a hub element (14). The hub element (14) has on one side a boss (16) for coupling to a rotary drive unit and on the opposite side a surface releasably attached to the pad (20). The pad has a central axis and a recess (22) centred about said axis and complementary with the attachment surface of the hub element (14) such that the attachment surface engages the base of the recess (22) and the pad (20) and the boss (16) are in substantially coaxial alignment. The releasable attachment is preferably provided by a hook-and-loop type fastener (24, 26).



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

APPLICATOR HEAD

This invention relates to an applicator head for attachment to a rotary drive unit. Such heads are used to finish surfaces and are commonly utilised in the motor trade.

5 Applicator heads are used in conjunction with various compounds to treat the surfaces of a wide range of materials including paint, metal composites and plastics. The compound is normally in the form of a paste or liquid. The heads typically consist of a
10 cylindrical pad with a hub element fixed to one end face for attaching the pad to the shaft of a drive unit. The pad material is selected according to the material to be treated or the particular stage of a series of treatments to the same surface.

15 In one known applicator head configuration, the pad is permanently fixed to the hub element and it is necessary to replace the complete head once the pad is worn out. Another form of head incorporates a replaceable pad arrangement, in which a "hook-and-loop"
20 type fastening system is used with components disposed on opposing planar faces of the pad and the hub element. Thus, once the pad had exceeded its useful life, it alone needs to be replaced, without also requiring a new hub element. However, with this arrangement it is difficult
25 to ensure that the hub element is fixed coaxially against the pad, with any eccentricity leading to increased vibration and wear.

 The present invention provides an applicator head comprising a pad and a hub element, which element has on
30 one side a boss for coupling to a rotary drive unit and on the opposite side a surface releasably attached to the pad, and the pad has a central axis and a recess centred about said axis and complementary with the attachment
 surface of the hub element such that the attachment
35 surface engages the base of the recess and the pad and the boss are in substantially coaxial alignment.

The releasable attachment may be provided by a hook-and-loop fastener, with the hooks on the attachment surface of the hub element and the loops on the recess. Preferably, the boss is integrally formed with the portion of the hub element providing the attachment surface. The pad may be substantially in the form of a solid cylinder, with the recess formed in an end face thereof. In one preferred arrangement the attachment surface and the base of the recess are substantially planar. Alternatively, the base of the recess may be substantially conical, with its vertex lying on the central axis of the pad.

An applicator head according to the invention provides for easy replacement of the pad itself, without the simultaneous need for a new hub element, but with minimal risk of it being eccentrically mounted on the hub element. The central and recessed location of the hub element also permits the pad to distort around it in use, with little risk of the hub element engaging the surface being treated and consequent damage thereto.

A known arrangement and an embodiment of the invention will now be described by way of example and with reference to the accompanying schematic drawings wherein:

Figure 1 is a plan view of a known applicator head; Figure 2 is a side view of the applicator head of Figure 1;

Figure 3 is a plan view of an applicator head in accordance with the invention; and

Figure 4 is a cross-sectional view of the applicator head of Figure 3 along line A-A.

In the known applicator head configuration of Figures 1 and 2, a hub element 2 consists of a boss 4 and a circular plate 6. The boss is provided centrally on the plate and is adapted to fasten to the end of a drive shaft, by means of a screw thread for example. A head of this type is typically for use with a hand-held polishing

machine. A substantially cylindrical pad 8 is mounted against the surface of the plate opposite the boss 4. The pad may be formed from natural or synthetic material, or a mix thereof, depending on its particular application. The pad 8 and hub element 2 are releasably attached together, using a "hook-and-loop" fastener, of the type sold under the registered trade mark "Velcro". Therefore it is only necessary to replace the pad itself once it is worn out, thus conserving materials and reducing the cost of renewing the head. Normally, a layer of loops 10 and a layer of hooks 12 are provided on the end face of the pad 8 and the opposing face of the plate 6, respectively, and not vice versa, as the loops are more susceptible to damage and can therefore be discarded with a worn pad.

The circular plate 6 in this arrangement covers substantially the whole of the end face of the pad 8. This maximises the surface area of attachment, thereby enhancing the securement of the pad to the plate. However, the edge of the plate may occasionally contact the surface being treated, causing damage thereto. Another problem is that the plate cannot be accurately positioned in axial alignment with a new pad. This results in increased vibration, wear and operator fatigue during use.

An applicator head of the invention is illustrated in Figures 3 and 4. It comprises a hub element 14 having a boss 16 which is integrally formed with a circular plate 18, and a substantially cylindrical pad 20. Different pad shapes may be appropriate for different purposes.

The circular plate 18 fits into a complementary recess 22 formed on one end face of the pad 20. Other configurations of the complementary surfaces may be adopted to provide different forms of engagement. For example, the provision of a shallow conical surface on the base of the recess may be beneficial. In another

alternative, undulations may be formed therein.

A releasable fastener is used to hold the circular plate 18 against the base of the recess 22, and is preferably of the "hook-and-loop" type. A layer of loops 24 is provided on the pad 20, with a layer of hooks 26 on the opposing surface of the hub element 14.

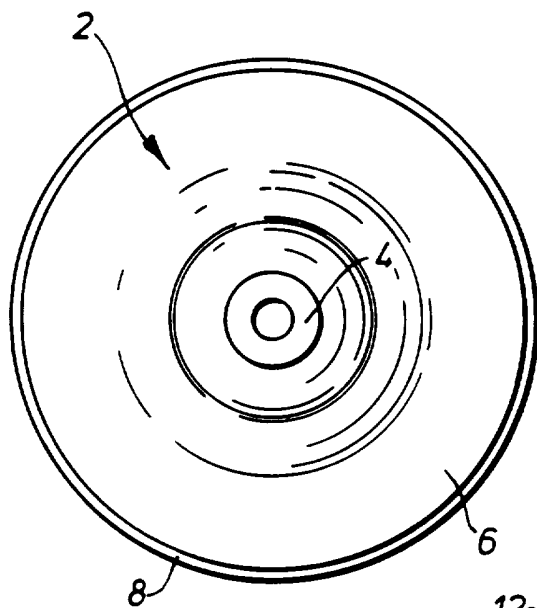
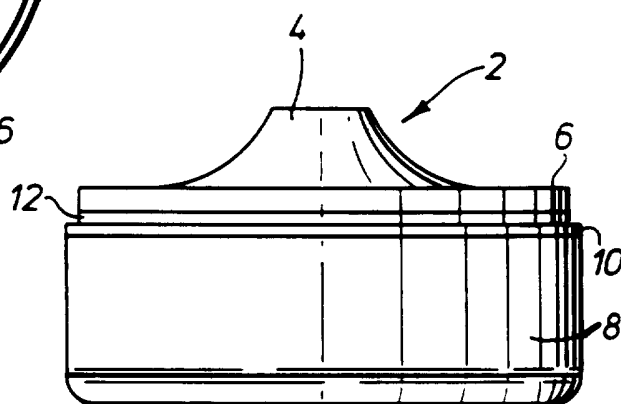
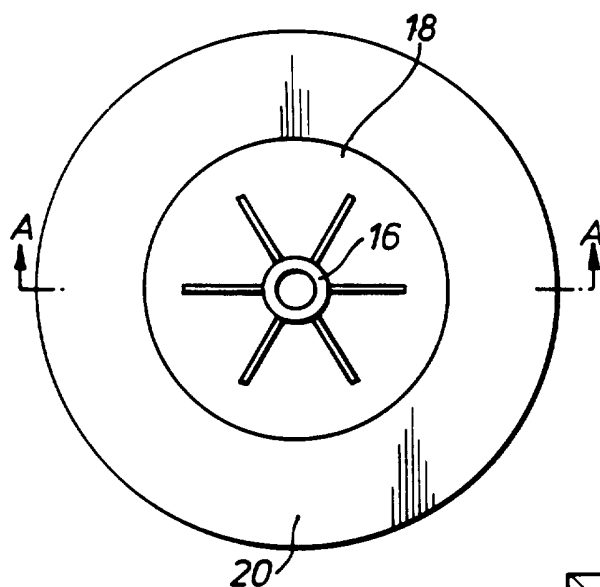
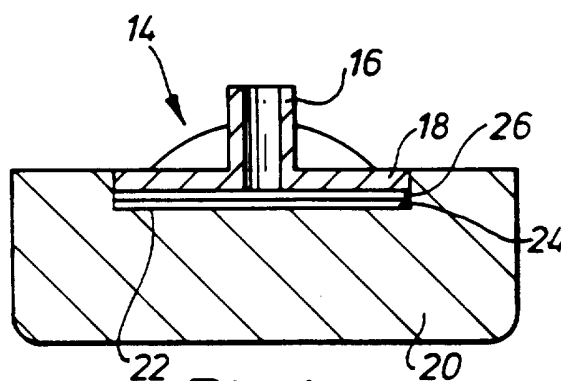
The hub element is preferably formed by an injection moulding process, a suitable plastic being one of the ABS group of copolymers. As noted above, the pad material is selected according to the particular treatment to be carried out. For example, for finishing painted surfaces, a high density non-absorbent foam is appropriate, which may be formed of polyester. The layers of loops and hooks are preferably fastened to the respective components of the applicator head using a solvent-borne polyurethane-based adhesive, although it will be appreciated any means for providing the requisite bond can be used.

As the plate shown in Figures 3 and 4 has a diameter significantly smaller than that of the pad, and is fitted in the recess 22, there is no risk of it contacting the surface being treated during use. The recess also serves to locate the plate substantially coaxially with respect to the pad. Thus a pad can readily be replaced in the appropriate position.

CLAIMS:

1. An applicator head comprising a pad and a hub
5 element, which hub element has on one side a boss for
coupling to a rotary drive unit and on the opposite side
a surface releasably attached to the pad, and the pad has
a central axis and a recess centred about said axis, and
complementary with the attachment surface of the hub
10 element such that the attachment surface engages the base
of the recess and the pad and the boss are in
substantially coaxial alignment.
2. An applicator head according to Claim 1 wherein said
releasable attachment is provided by a hook-and-loop
15 fastener, with the hooks on the attachment surface of the
hub element and the loops on the recess.
3. An applicator head according to Claim 1 or Claim 2
wherein the boss is integrally formed with the portion of
the hub element providing the attachment surface.
- 20 4. An applicator head according to any preceding Claim
wherein the pad is substantially in the form of a solid
cylinder with the recess formed in an end face thereof.
5. An applicator head according to any preceding Claim
wherein the attachment surface and the base of the recess
25 are substantially planar.
6. An applicator head according to any one of Claims 1
to 4 wherein the base of the recess is substantially
conical, with its vertex lying on the central axis of the
pad.
- 30 7. An applicator head substantially as described herein
with reference to Figures 3 and 4 of the accompanying
drawings.

1/1

*Fig.1.**Fig.2.**Fig.3.**Fig.4.*

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 96/00482

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B24D13/14 B24D13/20

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 6 B24D

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,4 907 313 (ROEKER DAVID C ET AL) 13 March 1990 see column 1, line 37 - column 2, line 16; figure 1	1-3,5,7
A	US,A,5 123 139 (LEPPERT DANA ET AL) 23 June 1992 see abstract; figure 2	1-5,7
A	EP,A,0 459 699 (MINNESOTA MINING & MFG) 4 December 1991 see abstract; figure 2	1-4,6,7

☐ 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.
- "&" document member of the same patent family

Date of the actual completion of the international search

6 June 1996

Date of mailing of the international search report

18.06.96

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

Eschbach, D

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/GB 96/00482

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4907313	13-03-90	US-A- 5001804 AU-B- 625543 AU-B- 5596490 AU-B- 600001 AU-B- 7562587 CA-A- 1311130 GB-A,B 2194470 GB-A,B 2232102 JP-A- 63043606	26-03-91 16-07-92 20-09-90 02-08-90 11-02-88 08-12-92 09-03-88 05-12-90 24-02-88
US-A-5123139	23-06-92	NONE	
EP-A-0459699	04-12-91	DE-D- 69103577 DE-T- 69103577 ES-T- 2057771	29-09-94 23-03-95 16-10-94