

FLUID APPLICATORS

This invention relates to applicators used to apply a fluid substance onto a surface. The invention is principally concerned with, and is specially

5 described herein in relation to applicators for applying a correction fluid to a paper surface to facilitate the correction of typing or writing mistakes. It is known to supply correction fluid in a bottle provided with a cap which incorporates an

10 applicator having a rigid stem extending from the underside of the cap, and an application element, most often a brush, carried at the free end of the stem. By holding the cap, the brush can be dipped into the fluid contained in the bottle to pick up a small portion of

15 the fluid, and by applying the brush to the surface of a sheet of paper a fairly broad band or stripe of correction fluid can be deposited onto the paper. When not in use, the cap is secured to the bottle, e.g. by a screw-threaded connection, and the applicator is

20 conveniently stored within the bottle. On the whole the known applicators of this kind work well. However, it can be difficult to lay down a stripe of fluid with uniform thickness and width over more than a short distance along the paper, e.g. when attempting to cover

25 over complete words or more than one word, at least with a single stroke of the brush. As a consequence it is frequently necessary to stroke the brush along the paper several times, which is inconvenient.

In accordance with the present invention

- 2 -

there is provided an applicator for applying a fluid to a surface, comprising an applicator tip element connected to the end of a substantially rigid stem by a part capable of flexing resiliently as the applicator tip element is stroked across a surface.

The application element should be capable of absorbing a portion of fluid when dipped into a body of the fluid, e.g. contained in a bottle, and of holding this fluid portion until the application element is applied to a surface. The application element is conveniently formed as a pad or a moulded member of porous material e.g. foam, which can be attached in various ways, e.g. by means of adhesive, heat welding or mechanical fixing, to the resiliently flexible connection part. It is also possible for the application element to be made of porous material and to be formed integrally with the resiliently flexible part.

The resiliently flexible part can be integral with the stem or it can be a separate part fixedly secured to the stem, e.g. by a root portion thereof being inserted into a bore provided in the end of the stem.

The resiliently flexible part may be capable of flexing in any direction, or it can be adapted e.g. in the manner of a living hinge, to define a predetermined axis about which the application element can pivot relative to the stem while being restrained against deflection in other directions.

The resiliently flexible connection part preferably allows the application element to deflect from a position substantially aligned with the stem to a position substantially at 90° thereto. When the application element is applied to a surface with a natural stroking action, which varies the angle at which the stem is inclined to the surface, there is a tendency to increase the force with which the

- 3 -

application element presses against the surface. However with an applicator according to the invention, the application element can deflect due to the resiliency of the connection part, and the force
5 against the paper does not vary greatly throughout the stroke. As a consequence the rate at which fluid is delivered onto the surface at the end of the stroke is not substantially different from that at the beginning of the stroke and a uniform stripe of fluid is
10 obtained.

A full understanding of the invention will be gained from the following detailed description of some embodiments, reference being made to the accompanying drawings, in which:

15 Figure 1 shows a first applicator embodying the invention;

Figure 2 illustrates the flexing capability of the applicator tip of the Figure 1 applicator;

20 Figure 3 is similar to Figure 2 but shows a modified construction;

Figure 4 shows another applicator embodying the invention;

Figure 5 is a side view of the connection component of the applicator in Figure 4;

25 Figure 6 is a front view of the connection component of Figures 4 and 5;

Figure 7 illustrates the flexing capability of the Figure 4 embodiment;

30 Figure 8 shows in axial section another applicator construction;

Figures 9a and 9b illustrate the flexing capability of the Figure 8 embodiment;

35 Figures 10 and 11 show the applicator of Figure 8 with respective forms of applicator tip element mounted to the flexible connection part;

Figure 12 is an axial section showing yet another applicator embodying the invention; and

- 4 -

Figures 13a and 13(b) illustrate the flexing capability of the application of Figure 12.

The correction fluid applicator shown in Figures 1 and 2 comprises a substantially rigid stem 1
5 attached to and projecting axially from the underside of a correction fluid bottle cap 2. At the lower end of the stem is a connection part 3 which is formed integrally with the stem.

The connection part includes a waisted
10 section 4 of reduced diameter defining a flexing point about which a lower portion of this part is able to deflect resiliently between a normal position axially aligned with the stem (condition (a) in Fig. 2) to a position substantially at 90° to the stem (condition
15 (c) in Fig.2). Fixed onto the connection part 3 is an application element in the form of a moulded tip member 5 of open cell foam which can be any required shape, e.g. with a pointed tip or with a flat blade-like edge. The foam tip member can be secured in any convenient
20 manner, such as by adhesive.

In use, the tip member is dipped into a body of correction fluid and absorbs some of the fluid. When the tip is applied to and moved across a surface with a natural stroking action, as the stroke
25 progresses the connection part 3 flexes causing the tip member to deflect progressively from the normal in line position in accordance with the sequence (a)-(b)-(c) shown in Figure 2. When the applicator is lifted from the surface at the end of the stroke, the connection
30 part 3 and tip member 5 revert to their in-line positions due to the resilience of the material of the connection part. This resilience also ensures that the tip member is pressed with an even force against the paper thereby, assisting in delivering fluid from the
35 tip member at a constant rate when the tip member is stroked across a paper surface.

The applicator shown in Figure 3 is largely

- 5 -

the same as that of Figures 1 and 2 and it differs only in that the connection part is formed as a separate component and fastened to the end of the stem 1.

Conveniently the connection part includes a root 6 or
5 peg which is fitted into and secured in a blind bore provided at the end of the stem.

Figures 4-7 show another applicator with a separate connection part fixed to the stem 1 in the same way as described in connection with Figure 3. The
10 connection part 3 has a generally flat blade section 8 around the free end edge of which a pad 9 of open cell foam is wrapped to form an application element. The blade section includes a pair of opposed notches 10 in its side edges which define a flexing point at which
15 the section will flex resiliently with respect to the stem. Due to the flat shape, the flexure occurs about a pivot axis, like a living hinge, the foam pad 9 being supported against movement relative to the stem in directions other than about the pivot axis. The
20 notches 10 also serve to locate and retain a collar or monofilament 11 tied around the foam pad to secure it to the connection part. Of course other methods of fixing could be used to secure the foam pad.

In use the applicator of Figs. 4-6 functions
25 in essentially the same way as that of Figs. 1-2, although the applicator in this instance needs to be oriented so that the pivotal axis about which flexing can occur is transverse to the direction of displacement of the foam pad application element over
30 the paper surface. At the beginning of an application stroke the foam pad is aligned with the stem as indicated in Fig. 7(a), and at the end of a full stroke it will be at about 90° to the initial position, as shown in Fig. 7 (b).

35 Figures 8-11 illustrate an applicator in which the resiliently flexible connection part consists of a straight rod 12 of rubber-like material, or

- 6 -

suitably resilient plastics, such as sintered ethylene vinyl acetate. The cross-section of the rod is not important and it may be conveniently circular, square or rectangular. One end of the rod acts as a root
5 inserted into a bore formed in the end of the rigid stem 1, and staked in position by a pin 13 inserted transversely through the stem and rod. The projecting portion of the rod is capable of flexing resiliently through about 90° as depicted in Figs. 9(a) and 9(b).
10 Carried on the projecting portion of the rod is the application element which can be of any convenient form such a pad 14 or sock of open cell foam secured on the rod by adhesive or by a mechanical fixing means. The foam application element can be of any desirable shape,
15 such as rounded as in Fig. 10 or more pointed as in Fig. 11.

The applicator of Figs. 12 and 13 is of the same general construction as those Figs. 8-11, but differs in that the application element 15 and the
20 resiliently flexible rod 12 which connects to the stem are made in one piece, such as a sintered ethylene vinyl acetate moulding or casting. Figs. 13 (a) and (b) illustrate the flexibility and indicate that the application element can be deflected to a position
25 approximately 90° to the normal position aligned with stem.

The applicators of Figs. 8-13 are used and operate by the application element flexing in the same way as described above in connection with the earlier
30 embodiments.

Although described in connection with correction fluid application, applicators according to the invention can be used for other purposes, e.g. applying cosmetics or make-up. Providing for resilient
35 deflection of the application element allows pressure to be applied without causing the application element to splay open, as occurs with the bristles of a brush.

- 7 -

Applying a uniform film of fluid has the further advantage that the drying time is substantially constant for all portions of the film. Furthermore, the deflection of the application element can improve
5 visibility and hence accuracy in use of the applicator.



THIS SHEET HAS BEEN
REPLACED

WO 97/21554



PCT/US96/19885

- 8 -

C L A I M S

1. An applicator for applying a fluid to a surface, comprising an applicator tip element connected to the end of a substantially rigid stem by a part
5 capable of flexing resiliently as the applicator tip element is stroked across a surface.
2. An applicator according to claim 1, wherein the connecting part allows the applicator tip element to be deflected from a normal position substantially
10 aligned with the stem to a position at about 90° to said normal position.
3. An applicator according to claim 1 or 2, wherein the connecting part defines an axis about which the applicator tip element is pivotable relative
15 to the stem.
4. An applicator according to any one of claims 1 to 3, wherein the connecting part permits deflection of the applicator tip element only in a single plane containing the stem axis.
- 20 5. An applicator according to claim 3 or 4, wherein the connecting part comprises a substantially flat section.
6. An applicator according to claim 1 or 2, wherein the connecting part comprises a rod of
25 resiliently flexible material.
7. An applicator according to any one of the preceding claims, wherein the resiliently flexible connecting part is integral with the stem.
8. An applicator according to any one of claims
30 1 to 6, wherein the connecting part includes a root portion fixed in a bore in the end of the stem.
9. An applicator element according to any one of claims 1 to 8, wherein the applicator tip element comprises a foam member attached to the resiliently
35 flexible connecting part.

This Sheet Has Been Replaced





THIS SHEET HAS BEEN
REPLACED

WO 97/21554



PCT/US96/19885

- 9 -

10. An applicator according to any one of the preceding claims, wherein the applicator tip element is made of porous material and is integrally formed with the connecting part.

This Sheet Has Been Replaced



1 / 4

FIG. 1

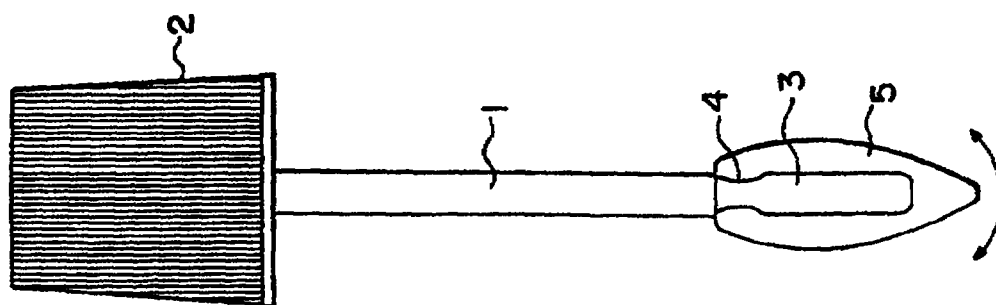


FIG. 2A

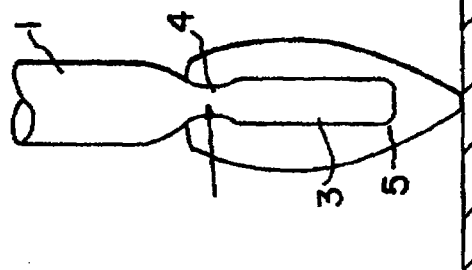


FIG. 2B

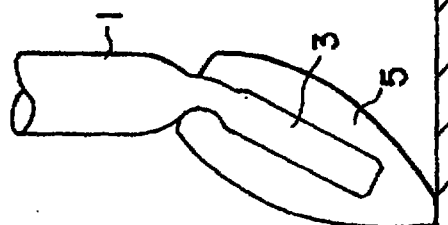


FIG. 2C

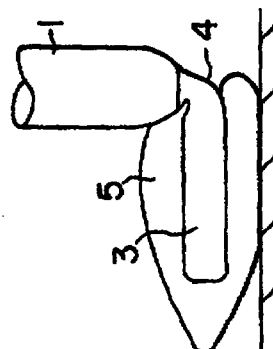


FIG. 3B

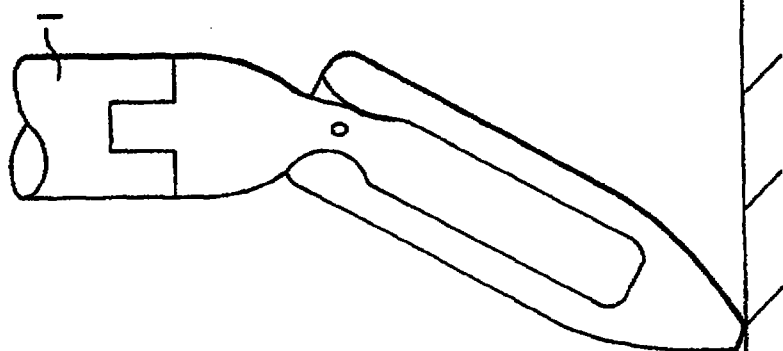


FIG. 3A

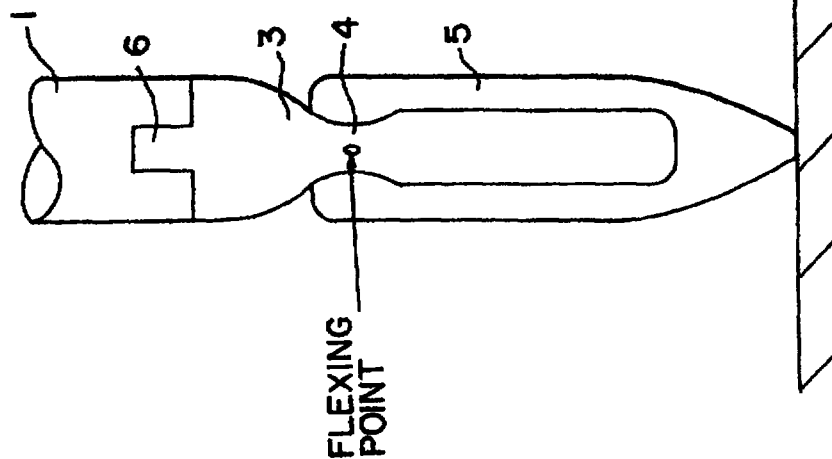
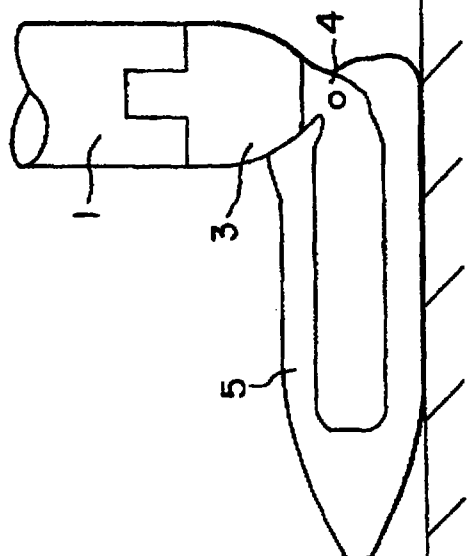


FIG. 3C



8 / 4

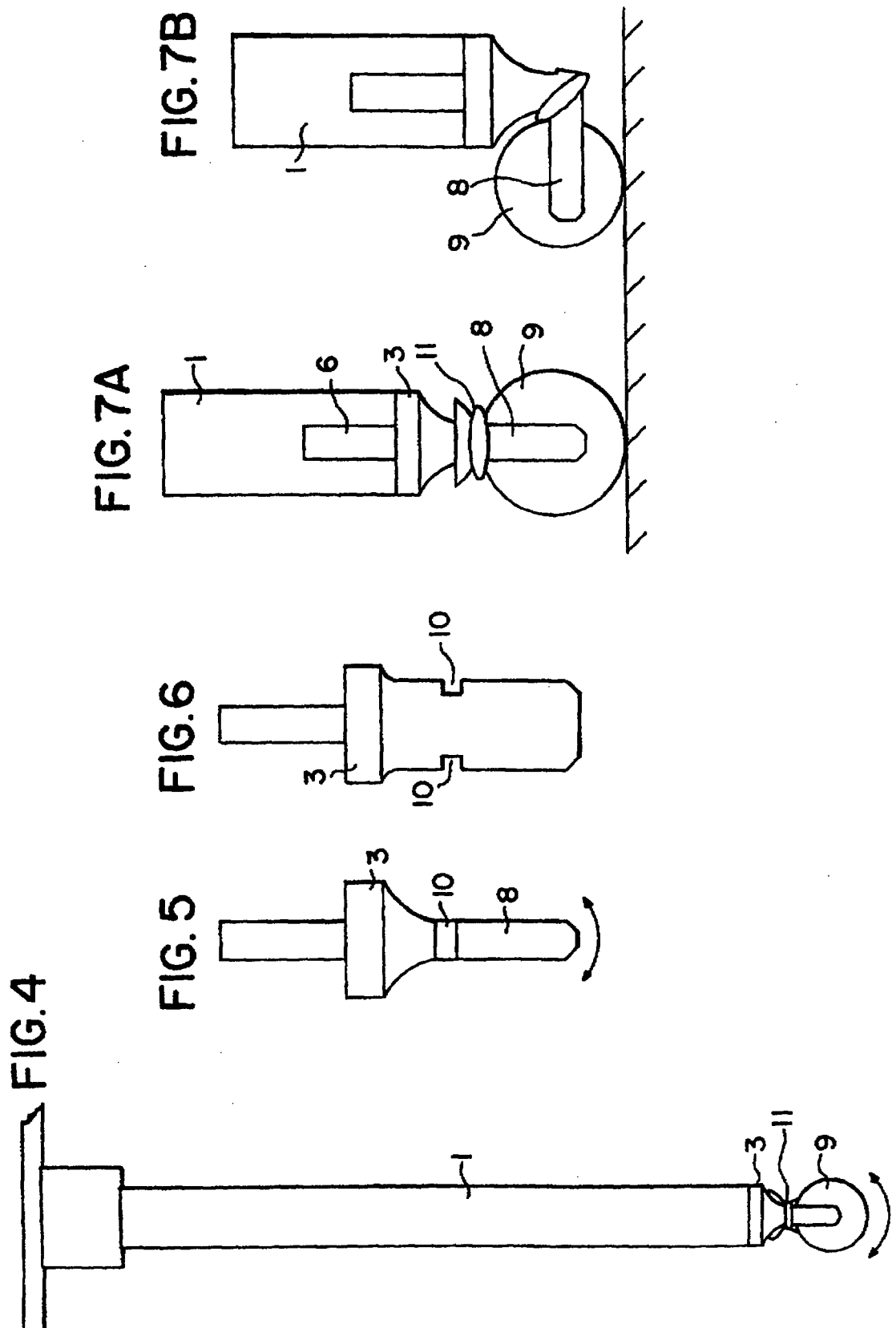


FIG. 8

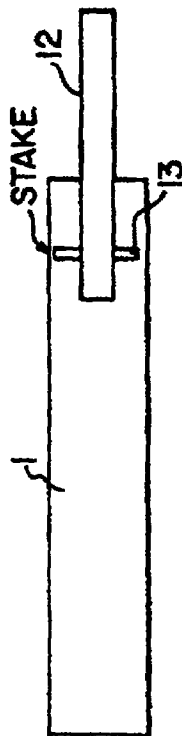


FIG. 12

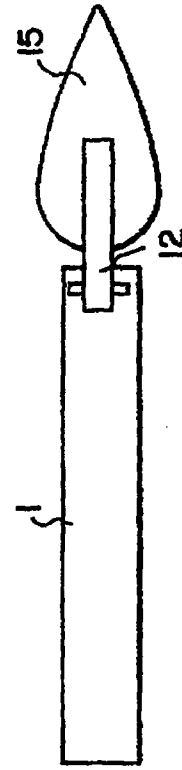


FIG. 9A

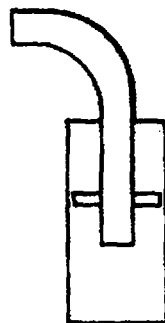


FIG. 9B

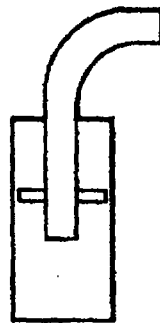


FIG. 10

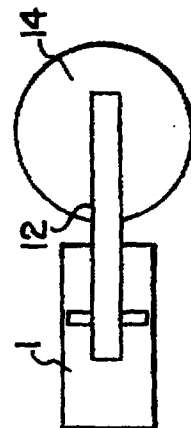


FIG. 11

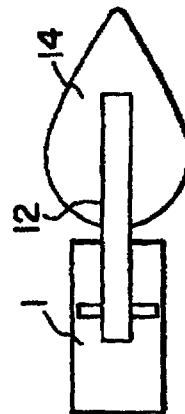


FIG. 13A

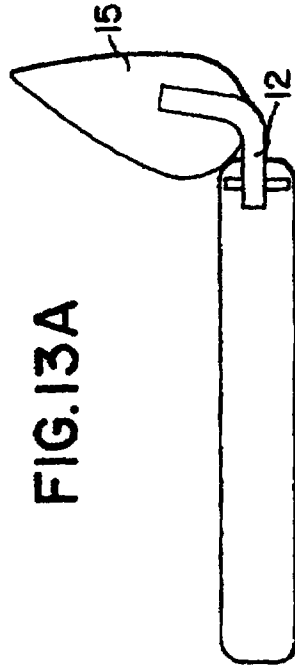
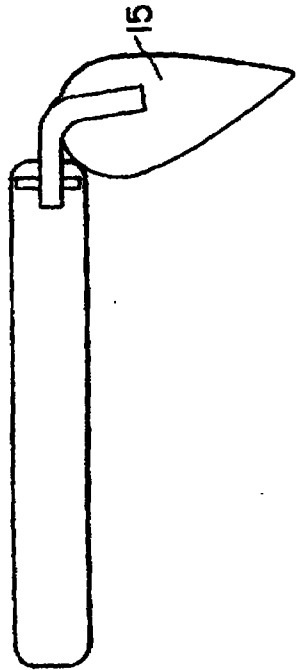
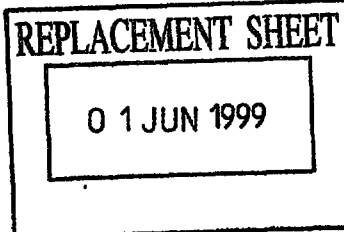


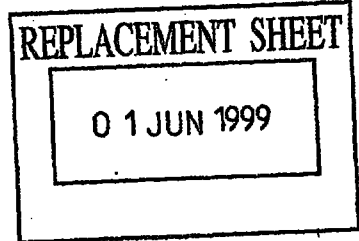
FIG. 13B





CLAIMS

1. An applicator for applying a fluid to a surface, said applicator including an applicator tip element (5) connected to the end of a part (3) capable of flexing resiliently as the applicator tip element (5) is stroked across a surface, characterized in that said applicator includes a substantially rigid stem (1), and in that said part (3) capable of flexing and said tip element (5) are connected to an end of said stem (1).
2. An applicator according to claim 1, characterized in that the end of said stem (1) remote from said tip element (5) depends from the underside of a cap (2), whereby said stem (1), tip element (5) and part are positioned within a container when said cap (2) is engaged thereon.
3. An applicator according to claim 1 or 2, characterized in that the stem (1) is hingedly connected to the tip element (5).
4. An applicator according to any one of claims 1 to 3, characterized in that the connecting part (3) allows the applicator tip element (5) to be deflected from a normal position substantially aligned with the stem (1) to a position at about 90° to said normal position.
5. An applicator according to any one of claims 1 to 4, characterized in that the connecting part (3) defines an axis about which the applicator tip element (5) is pivotable relative to the stem (1).
6. An applicator according to any one of claims 1 to 5, characterized in that the connecting part (3) permits deflection of the applicator tip element (5) only in a single plane containing the stem axis.
7. An applicator according to claim 5 or 6, characterized in that the connecting part includes a substantially flat section.
8. An applicator according to claim 1 or 2, characterized in that the connecting part (3) includes a rod of resiliently flexible material.
9. An applicator according to any one of the preceding claims, characterized in that the resiliently flexible connecting part is integral with the stem.
10. An applicator according to any one of claims 1 to 8, characterized in that the connecting part includes a root portion fixed in a bore in the end of the stem.
11. An applicator according to any one of claims 1 to 10, characterized in that the applicator tip element includes a foam member attached to the resiliently flexible



connecting part.

12. An applicator according to any one of the preceding claims, characterized in that the applicator tip element (5) is made of porous material and is integrally formed with the connecting part (3).

13. An applicator for applying a fluid to a surface, said applicator including an applicator tip element (5) connected to the end of a stem (1) by a part (3) capable of flexing resiliently as the applicator tip element (5) is stroked across a surface, characterized in that said stem (1) is substantially rigid, and in that the other end of said stem (1) extends from the underside of a cap (2), said stem (1), tip element (5) and flexing part (3) being within a container when said cap (2) is placed on said container holding said fluid.

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International BureauRTMP
COPY

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: B43L 19/00, A45D 40/26	A1	(11) International Publication Number: WO 97/21554 (43) International Publication Date: 19 June 1997 (19.06.97)
(21) International Application Number: PCT/US96/19885 (22) International Filing Date: 12 December 1996 (12.12.96) (30) Priority Data: 9525696.2 ✓ 15 December 1995 (15.12.95) ✓ GB (71) Applicant (for all designated States except US): THE GILLETTE COMPANY [US/US]; Prudential Tower Building, Boston, MA 02199 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): LIGHTFOOT, Mark, Roger [GB/GB]; 41 Markby Way, Lower Earley, Reading, Berkshire RG6 3BG (GB). (74) Agents: GALLOWAY, Peter, D.; Ladas & Parry, 26 West 61st Street, New York, NY 10023 (US) et al.		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, 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, VZ, 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 <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: FLUID APPLICATORS (57) Abstract An applicator for applying a fluid to a surface comprises an applicator tip element (5) connected to the end of a substantially rigid stem (1) by a part (3) capable of flexing resiliently as the applicator tip element is stroked across a surface. The application element is conveniently formed as a pad or a moulded member of porous material e.g. foam, which can be attached in various ways, e.g. by means of adhesive, heat welding or mechanical fixing, to the resiliently flexible connection part. 