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"Improvements in or relating to adhesive dispensers"

THE PRESENT INVENTION relates to adhesive dispensers.

A known adhesive dispenser for dispensing cyanoacrylate adhesive comprises a dispenser barrel containing a deformable pipette charged with the adhesive to be dispensed. The pipette extends axially within the barrel of the dispenser with a nozzle of the pipette projecting through an end wall of the barrel at one end of the barrel. A pair of dispensing buttons project through opposed holes formed in the side wall of the barrel and, in use, the adhesive is dispensed from the pipette by gently squeezing the dispensing buttons. The action of squeezing the buttons compresses the pipette within the barrel and forces adhesive out of an outlet passage in the pipette nozzle.

The known dispenser comprises a protective push-fit cap which is attached to the one end of the barrel to enclose the projecting pipette nozzle when the dispenser is not in use. The dispenser is supplied with the outlet passage in the pipette of the nozzle in a closed condition and, when the dispenser is used, the cap is removed and the pipette nozzle is pierced with a standard pin to open the outlet passage for the adhesive. When the pin is removed from the nozzle prior to operation, adhesive often escapes from the pipette under pressure. This can result in dangerous adhesive getting onto the hands or clothes of a user.

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The push-fit cap of the known dispenser is also readily removed simply by pulling the cap and barrel apart and thus represents a hazard if the dispenser should fall into the hands of a small child.

The present invention aims to overcome, or at least mitigate, the above disadvantages of the known dispenser.

Accordingly, the present invention provides an adhesive dispenser comprising: a barrel which houses a deformable pipette charged with adhesive and having a nozzle projecting from one end of the barrel; dispensing means carried by the barrel for compressing the pipette to dispense adhesive through an outlet passage in the pipette nozzle; a cap for attachment to the one end of the barrel to enclose the projecting pipette nozzle; and pin means carried by the cap for penetrating the outlet passage of the pipette nozzle when the cap is attached to the barrel.

In order that the present invention may be more readily understood, an embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of an adhesive dispenser embodying the present invention, showing a cap of the dispenser being removed;

Figure 2 is a plan view of the underside of the cap of the adhesive dispenser of Figure 1, with a pin unit of the cap removed;

Figure 3 is a cross-sectional view on the line III-III of Figure 2;

Figure 4 is a plan view of the cap, showing the



location of mounting holes for the pin unit of the cap;

Figure 5 is a plan view of the adhesive dispenser of Figure 1, with the cap removed;

Figure 6 is a fragmentary perspective view of the adhesive dispenser of Figure 1, showing the cap removed from the barrel;

Figure 7 is a plan view of a locking sleeve of the adhesive dispenser of Figure 1;

Figure 8 is a cross-sectional view on the line VI-VI of Figure 7;

Figure 9 is a side view of a pin unit of the cap;

Figure 10 is an end view of the pin unit of Figure 9;

Figure 11 is a perspective view of the adhesive dispenser of Figure 1 in a locked condition.

Figure 12A is an axial sectional view of the nozzle for a deformable pipette of the adhesive dispenser;

Figure 12B is an axial sectional view of a modified nozzle for the pipette of the dispenser; and

Figure 13 is an axial cross-sectional view of a modified cap construction for the adhesive dispenser.

Referring to the drawings, an adhesive dispenser 1 embodying the present invention comprises a hollow rigid barrel 2 containing a deformable pipette (not shown) having a nozzle 3 (Figure 6) projecting from one end of the barrel. A protective cap 4 of plastics material is



attached to the one end of the barrel to enclose the nozzle 3 of the deformable pipette. A locking sleeve 5 mounted on the one end of the barrel 2 enables the cap 4 to be securely locked to the barrel 2 when the dispenser is not in use.

As shown in the drawings, the hollow barrel 2 has a substantially oval cross-section. Apertures 6 are formed in the opposing major longitudinal surface regions of the barrel 2 and dispensing buttons 7, having a diameter slightly less than that of the apertures 7, are biased apart to project through the apertures 6. The dispensing buttons 7 have enlarged actuating portions (not shown) disposed within the barrel 1 for engaging and compressing the charged pipette when the buttons are pressed inwardly of the barrel 2. A pair of arcuate projections 8 are formed on the barrel above and below each dispensing button 7.

The minor longitudinal surface regions of the barrel 2 are formed with a pair of opposed locking windows 9 spaced from an end wall 10 of the barrel at the one end of the barrel.

A central hollow mounting boss 11 projects axially from the end wall 10 of the barrel 2 and has a cylindrical portion 12 formed with an external screw thread. A pair of clips 13, each comprising a pair of opposed upstanding jaws 15 defining a nip 17 therebetween, project from the end wall 10 of the barrel on respective sides of the mounting boss 11 on the major axis of the oval end wall 10. At each end of its major axis, the end wall 10 is formed with an arcuate aperture 19 circumferentially aligned with a respective one of the locking windows 9 in the side wall of the barrel 2.

As shown in Figure 6, an end portion of the



mounting boss 11 is formed as a block 23. The deformable pipette (not shown) charged with adhesive extends axially in the barrel 1 with the nozzle 3 of the pipette projecting out of the barrel through the mounting boss 11 of the end wall 10. As shown in phantom in Figure 6, the pipette nozzle 3 has an adhesive outlet passage 26 formed with an internal barrier 27 which closes the passage 26 until pierced.

The locking sleeve 5 of the dispenser is shown in more detail in Figures 7 and 8. This locking sleeve comprises an oval collar 29 which carries a pair of locking legs 31 depending from the inside surface of the collar 29 at opposite ends of the major axis of the collar. The free end of each locking leg 31 is formed with an outwardly directed lug 33. A lower surface of each lug 33 is chamfered to form a ramp surface 34 and the upper surface of each lug 33 extends radially to form an abutment surface 35. The locking legs 31 are dimensioned to pass into the barrel 1 through the arcuate apertures 19 in the end wall 10 of the barrel when the collar 29 is fitted onto the one end of the barrel as shown in Figure 1 and the lugs 33 are dimensioned to project through the locking windows 9 when axially aligned therewith, as shown in Figure 11.

The protective cap 4 of the dispenser is generally oval in cross-section to match the dispenser barrel 2 and comprises an end wall 38 with a depending peripheral wall 39 terminating in a skirt 43 of reduced thickness. A slit 41 formed in the peripheral wall 39 extends axially towards the end wall from the lower edge of the skirt 43 and is disposed at one end of the minor axis of the oval cross-section of the peripheral wall. The skirt 43 is also formed with two further axially extending slits 47 located at respective ends of the major axis of the oval cross-section of the skirt 43. The two slits 47 are



positioned above the apertures 19 in the end wall 10 of the barrel 2 when the cap 4 is in place on the barrel 2.

A cylindrical mounting socket 49 depends centrally within the cap 4 and is provided with an internal screw thread adapted to be engaged with the external screw thread on the mounting boss 11 of the barrel 2 to attach the cap 4 to the barrel 2. The mounting socket 49 is also provided with an axially extending slit 50 aligned with the slit 41 in the peripheral wall 39 of the cap 4.

Two latching arms 53 extend axially within the cap 37 on opposite sides of the mounting skirt 49 between the mounting skirt and the slits 47 in the skirt 45. The latching arms 53 are adapted to engage in nip of the clips 13 provided on the end wall 10 of the barrel 2 when the cap 4 is attached to the barrel.

An axially extending pin unit 54 is mounted centrally in the cap 4 concentrically within the mounting skirt 49, so as to be aligned with the nozzle 3 of the pipette projecting through the boss 11 when the cap 4 is applied to the barrel 2. As shown in Figures 9 and 10, the pin unit 54 comprises a longitudinally ribbed mounting body 52 which is made of plastics material and is received in a mounting bore 55 (Figure 3) of the cap 4, which mounting body 52 carries on stalks 56 two locating pegs 57 which are received in corresponding bores 58 (Figure 4) in the cap 4 when the body 52 is received in bore 55. A metal pin 59 extends from the mounting body and is enclosed by a shroud 60 formed with an axial slit 61 which is aligned with the slits 41, 50 in the peripheral wall 39 and mounting socket 49 of the cap 4 when the pin unit 54 is installed in the cap. The pin 59 has a length such that, when the cap 4 is in place on the barrel 2, the pin 59 extends into the outlet passage 26 in the pipette nozzle 3 beyond the barrier 27,



with the pin shroud 60 enclosing the nozzle 3.

In order to assemble the described adhesive dispenser embodying the invention after loading of a charge pipette into a barrel 1, the locking legs 31 of the locking sleeve are inserted into the respective apertures 19 in the end wall 10 of the barrel 2. The collar 29 is then pushed downwardly until the lugs 33 project through the windows 9 in the barrel 2. Continued downward pressure on the collar 29 depresses the lugs 33 inwardly as a result of the ramp surfaces 34 of the lugs to enable the legs to be inserted further into the barrel until the collar 29 which is an inoperative position resting on the end wall 10 of the barrel 2.

The cap 4 is then applied to the barrel 2 and the action of screwing the mounting socket 49 onto the mounting boss 11 of the barrel 2 drives the pin 59 into the outlet passage 26 of the pipette nozzle 3. The correct engagement can be checked through the slits 41, 50 and 61 in the peripheral wall 39, mounting socket 49 and shroud 60. As the cap 4 is rotated further, the pin 59 is forced through the internal barrier 27 in the outlet passage 26 of the pipette nozzle 3, thus opening the passage for adhesive when the pin 59 is subsequently removed with the cap 4. The slit 61 in the shroud 60 allows flexing of the shroud when removing the cap 4 and thus prevents the shroud from sticking to the pipette nozzle 3 when the cap 4 is left in place on the barrel 2.

When the cap is in place, the latching arms 53 are engaged in the clips 13 on the end wall 10 of the barrel and the slits 47 are aligned with the apertures 19 in the end wall 10 of the barrel 2.

In order to provide child-proof locking of the cap 4 on the barrel 2, the collar 29 can then be raised from



its inoperative position (Figure 1) into an operative locking position in which the lugs 33 project through the windows 9 in the barrel 2 and the collar 29 encloses the skirt 43 of the peripheral wall 39 of the cap. The abutment surface 35 of the lugs 33 then ensures that the lugs 33 are secured in the windows 9 against further upward movement. Furthermore, as the collar 29 is raised, the upper end of the legs 31 of the locking sleeve 5 engage in the slots 47 in the skirt 43 of the cap 4 and thereby prevent the cap from being rotated and thus removed until the lugs 33 are depressed and the collar 29 is moved downwardly into its inoperative position.

If the pin unit 54 should become stuck to the pipette nozzle 3, the application of a torque exceeding a predetermined value when removing the cap 4 will cause the frangible connections between the mounting pins 57 and the mounting body to shear, thereby separating the pin means from the cap and allowing the rest of the cap to be unscrewed without damaging the pipette nozzle. The pin unit can then be gently prised of the nozzle and continue to be used as a separate unit from the cap.

Figure 12A is an axial cross-sectional view through the nozzle 3 of the deformable pipette of the adhesive dispenser 1 of Figures 1 to 11 with the piercable internal barrier 27 near the tip of the nozzle. It has been found, however, that with an internal barrier 27 at this location the pin 59 penetrates a long way past the barrier upon sealing the dispenser after use. As a consequence glue may tend to accumulate around the pin 59 and make it difficult to withdraw the pin after some time. Further, under some circumstances the withdrawal of the pin 59 may leave a residual quantity of gelled adhesive below the barrier 27, thereby clogging the nozzle. The alternative nozzle 123 illustrated in Figure 12B is intended to overcome this problem by the re-



positioning of the internal barrier 127 near the base of the nozzle, which means that the tip of the pin 59 only just pierces the barrier and insufficient of the pin protrudes past the barrier to accumulate adhesive.

Figure 13 illustrates a modified cap construction 104 for the adhesive dispenser 1, in which a pin shroud 160 is formed integrally with the rest of the cap 104 and a PTFE-coated stainless steel pin 159 is forced into the cap from above into the position shown in dashed lines in Figure 13 so as to extend through the bore 155 and the shroud 160 into the interior of the cap. The pin 159 has a flattened oval head 159a which has a major dimension greater than the diameter of the enlarged portion 155a of bore 55 into which it is driven, so that the head bites into the plastic of the cap 104 to prevent the pin 159 being pushed out or rotating so as reliably to enable the torque to be applied to the cap to separate the pin from the nozzle 23 or 123.



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CLAIMS:

1. An adhesive dispenser comprising: a barrel which houses a deformable pipette charged with adhesive and having a nozzle projecting from one end of the barrel; dispensing means carried by the barrel for compressing the pipette to dispense adhesive through an outlet passage in the pipette nozzle; a cap for attachment to the one end of the barrel to enclose the projecting pipette nozzle; and pin means carried by the cap for penetrating the outlet passage of the pipette nozzle when the cap is attached to the barrel.
2. An adhesive dispenser according to claim 1, wherein the pin means comprises a pin for penetrating the outlet passage of the pipette nozzle and a pin shroud surrounding the pin and fitting over the pipette nozzle when the cap is attached to the barrel.
3. An adhesive dispenser according to claim 2, wherein the shroud is formed with a slit permitting flexing of the shroud to obviate adhesion of the shroud to the pipette nozzle.
4. An adhesive dispenser according to any one of claims 1 to 3, wherein the cap is screw-threadedly attached to the barrel.
5. An adhesive dispenser according to claim 4, wherein the cap has an internally screw-threaded mounting socket for engagement with an externally screw-threaded hollow mounting boss which projects from an end wall at the one end of the barrel and through which the pipette nozzle extends..
6. An adhesive dispenser according to claim 5, when



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appendant to claim 3, wherein the mounting socket of the cap is enclosed by a peripheral wall of the cap and the mounting socket and peripheral wall are each formed with a slit aligned with the slit in the pin shroud so that the pin can be viewed through the cap.

7. An adhesive dispenser according to any preceding claim, wherein the pin means is attached to the cap by a frangible connection adapted to break when the cap is subjected to a force exceeding a predetermined value when removing the cap, thereby to allow the pin means to separate from the rest of the cap to obviate damage to the pipette nozzle when attempting to remove the cap with the pin means stuck to the nozzle.

8. An adhesive dispenser according to any one of claims 1 to 6, wherein the pin means is integrally connected to cap.

9. An adhesive dispenser according to any preceding claim, wherein the cap carries a first latch member for co-operating with a second complementary latch member on the one end of the barrel when the cap is attached to the barrel.

10. An adhesive dispenser according to claim 9, wherein one of the first and second latch members is a latching finger and the other latch member is a clip having a nip for receiving a free end of the latching finger when the cap is attached to the barrel.

11. An adhesive dispenser according to any preceding claim, comprising locking means movable between an inoperative position permitting removal of the cap from the barrel and an operative position in which removal of the cap is precluded.

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12. An adhesive dispenser according to claim 11, wherein the cap is screw-threadedly attached to the barrel and the locking means comprises an axially movable locking sleeve on the one end of the barrel, which locking sleeve comprises first abutment means co-operating with the barrel to hold the collar in its operative position and second abutment means co-operating with the cap to prevent rotation of the cap with the locking sleeve in its operative position.

13. An adhesive dispenser according to claim 12, wherein the first abutment means comprises a lug on the locking sleeve adapted to project through a locking window of the barrel in the operative position of the locking sleeve and the second abutment means comprises a projection on the locking sleeve adapted to engage in a locking recess of the cap to prevent rotation of the cap.

14. An adhesive dispenser according to any preceding claim, wherein the barrel and the cap are each oval in cross-section.

15. An adhesive dispenser according to any preceding claim, wherein an internal barrier in the outlet passage of the pipette nozzle closes the outlet passage until the cap is attached to the barrel and is so located in the outlet passage that it is pierced only by a tip of the pin means.

16. An adhesive dispenser substantially as hereinbefore described with reference to the accompanying drawings.

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