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Selected US specifications from IPC sub-class B05C

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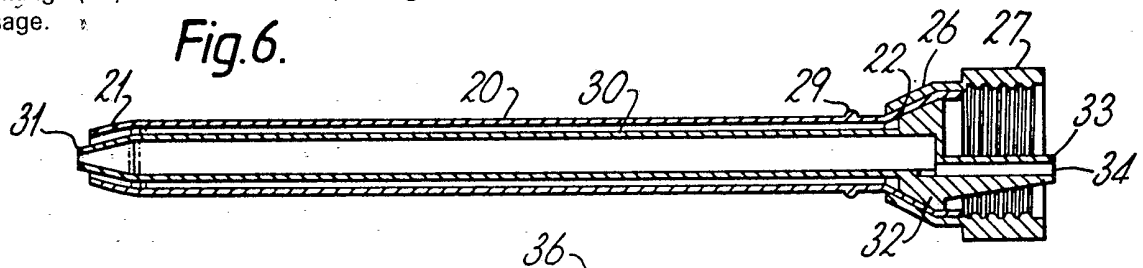
(54) Dispenser for two-part adhesive

(57) A nozzle for dispensing flowable components of a two-part chemically reactive system defines a separate respective dispensing passage (40,41) for each component of the system, each passage having an opening (42,43) adjacent a tip of the nozzle, the nozzle being configured such that at least one said opening is spaced axially from a point (39) at which components being dispensed through the passages come into contact with each other. This off-set arrangement of at least one opening from the point at which components come into contact with each other ensures that when the flow of the component ceases there is a separation between the components so that no further reaction takes place. This prevents the end of the nozzle from becoming clogged by an excess of the components which has set hard at the end of the nozzle.

In the arrangement of Fig. 6 wherein the nozzle comprises inner and outer co-axial passages for the two components, the nozzle is connected to the valved outlet spigot (7) of a container (Fig. 1), having separate compartments for the components, by means of a coupling which includes a frusto-conical flange (32) having a projecting member (33) with a bore (34) for feeding one of the components to the inner tube (30). The flange (32) includes notches (35, Fig. 8) for feeding the other component into the annular outer passage.

Fig.6.



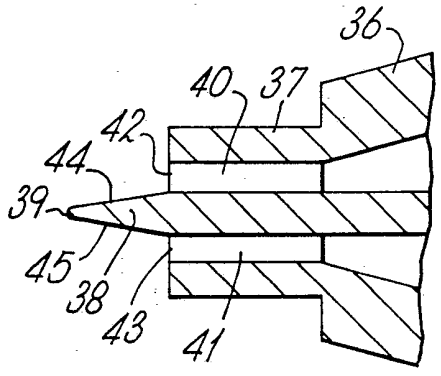


Fig.11.

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

Fig.1.

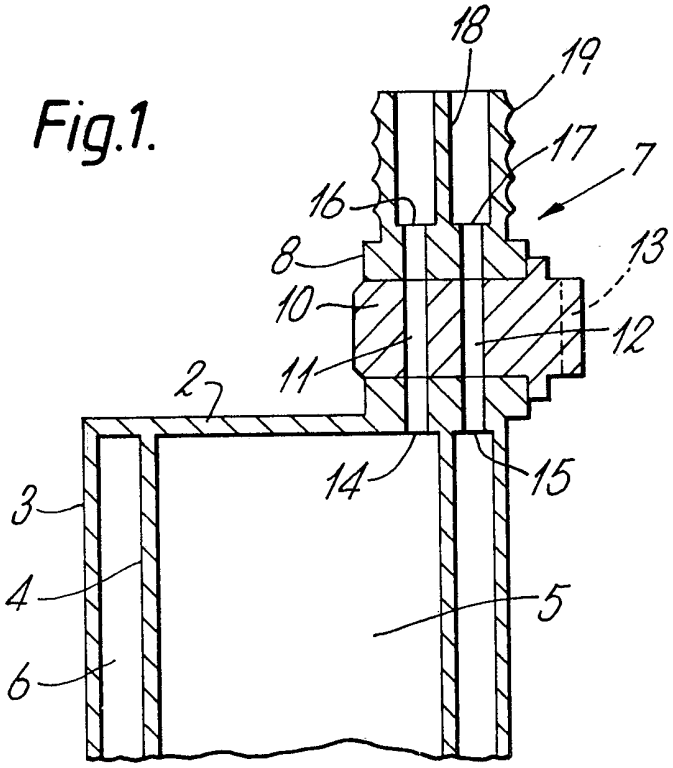
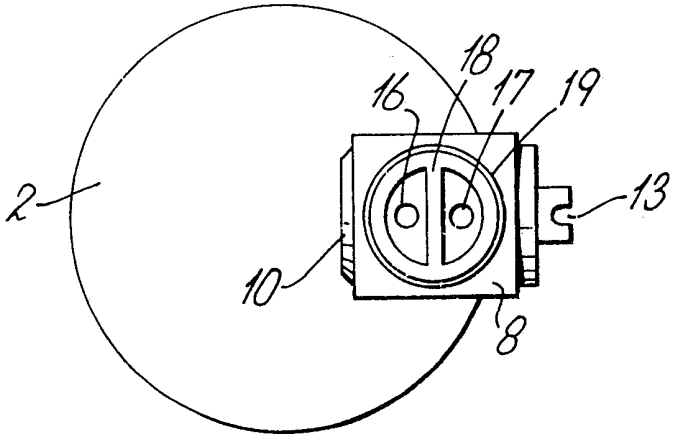


Fig.2.



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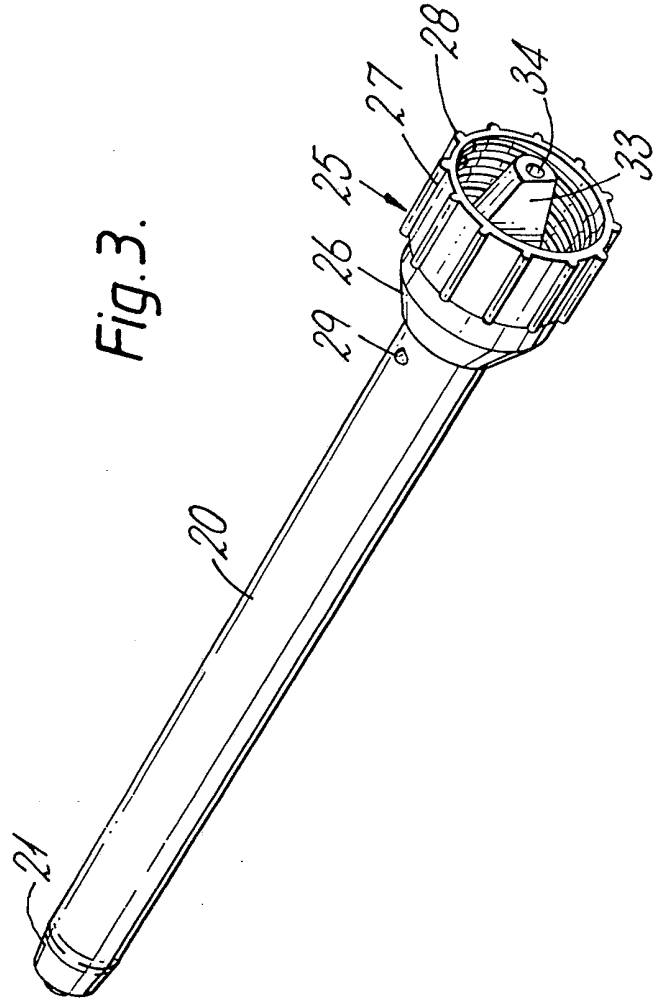


Fig.3.

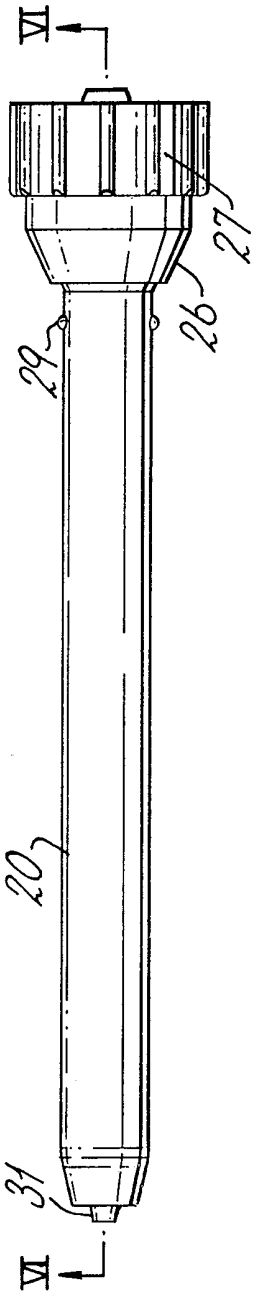


Fig.4.

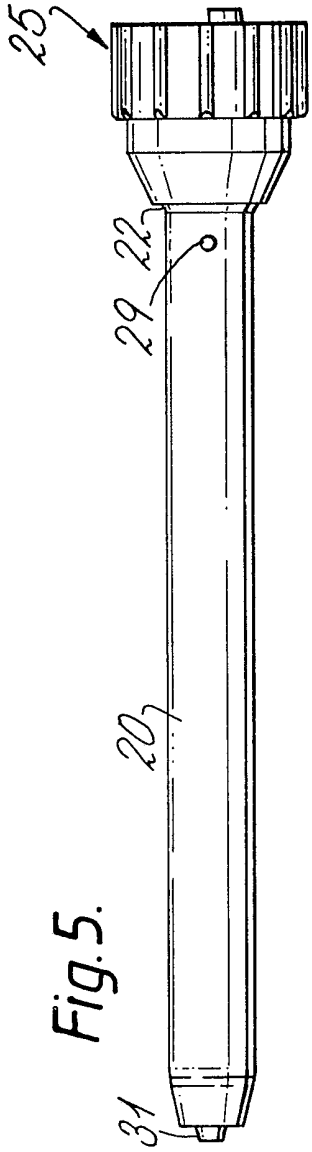


Fig.5.

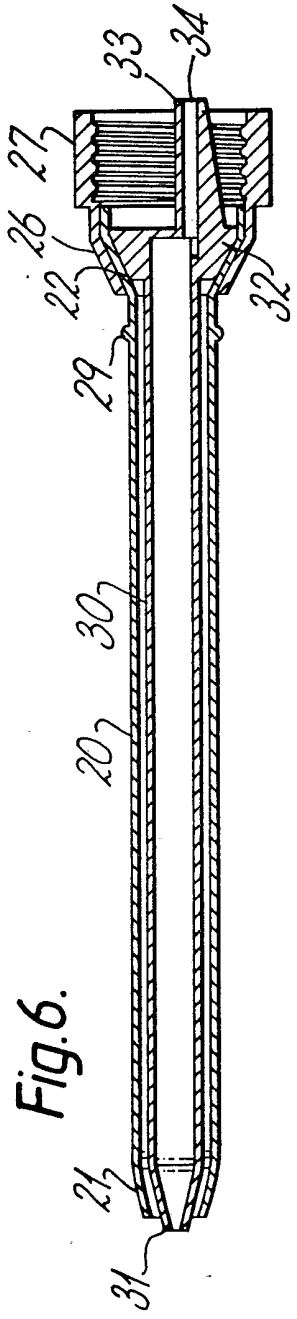


Fig.6.

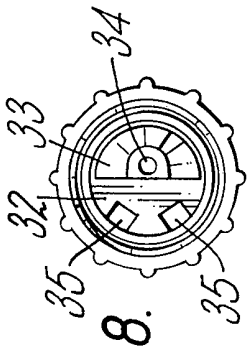


Fig.8.

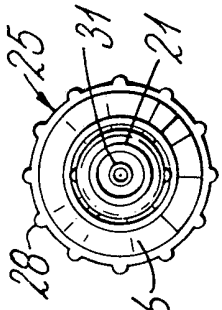


Fig.7.

Fig.9.

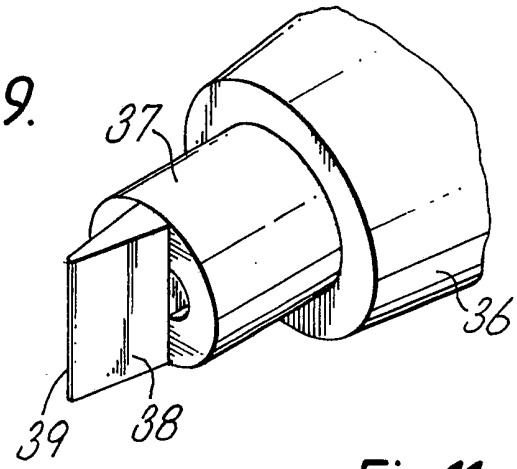


Fig.10.

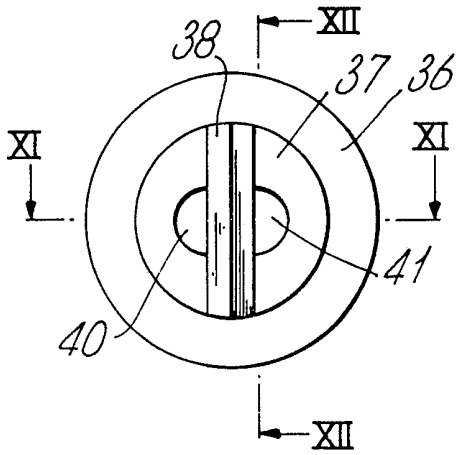


Fig.11.

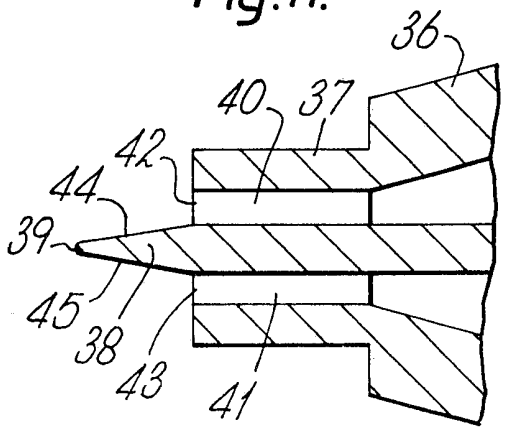


Fig.12.

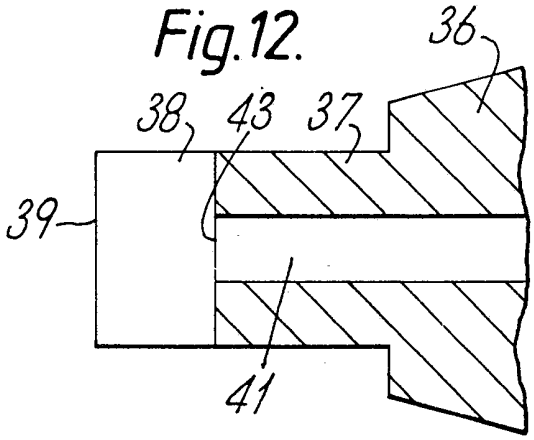


Fig.13.

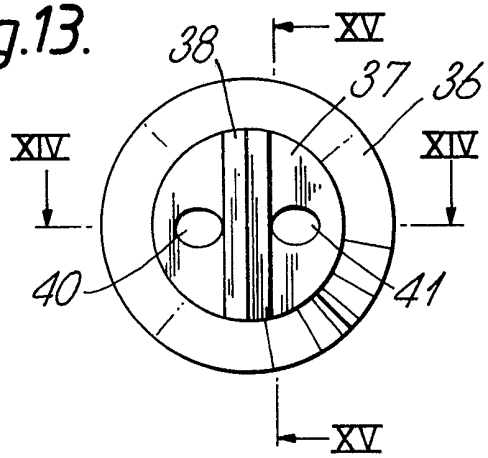


Fig.14.

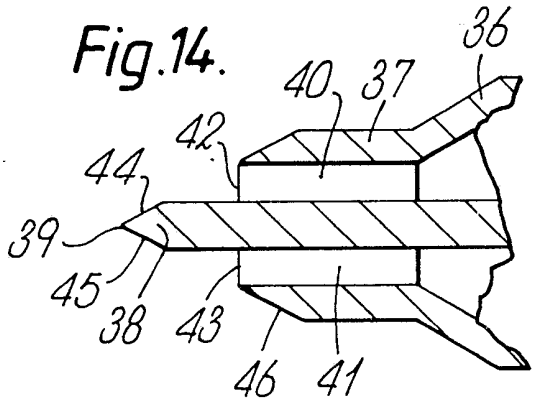
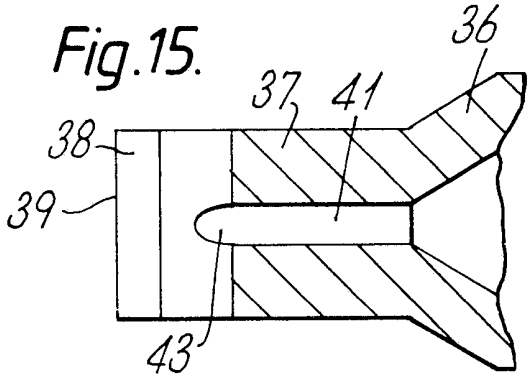


Fig.15.



SPECIFICATION

Improvements in or relating to a dispensing arrangement

This invention relates to improvements in or relating to a dispensing arrangement for the simultaneous dispensing of flowable substances, such as the two components of a two-part chemically reactive system.

Various products, such as some adhesives, are supplied to the user in the form of two flowable substances which are mixed together at the point of use, so as to react and form the desired end product, such as a settable adhesive. In the present document such an arrangement will be referred to as a reactive system.

It is known to supply the two components of such a reactive system in separate containers and to extrude quantities of the two components from their respective containers onto a mixing surface before mixing together and subsequent use of the mixture. This is, however, a clumsy process and it is difficult always to dispense the substances in the required proportions.

It is also known to provide the two components in a single container in separated compartments and to extrude the components together from the single container through a common dispensing nozzle in which the two components mix and from which the two components are extruded as a mixture. This arrangement has the disadvantage that the components react in the nozzle to form the end product, so that the nozzle is not reusable. The reaction between the components also continues back into the respective compartments of the container and thereby renders the remaining supply of the components useless since they will have set hard within the container.

It has also been proposed to use a single container for the two components, but to use a dispensing nozzle having two separated passages through which the two components pass in isolation, so that they are dispensed from the nozzle in side by side relationship. This arrangement is quite convenient but suffers from some of the drawbacks of the separate containers approach.

All of the known dispensing arrangements described above have drawbacks and it is an object of the present invention to provide an improved dispensing arrangement for such two component reactive systems. In particular the invention seeks to provide a dispensing arrangement which may be used on an infrequent or random basis without the problem of the arrangement becoming clogged due to the setting of the components within the dispenser.

According to one aspect of this invention there is provided a dispensing nozzle for use in dispensing flowable components of a reactive system, said nozzle defining a separate, respective dispensing passage for each component, each passage having an opening adjacent a tip of the nozzle, the nozzle being configured such that at least one said opening is spaced axially from a point at which components being dispensed through said passages come into contact with each other.

Preferably said dispensing passages are arranged parallel to each other and extend axially within the nozzle.

Conveniently said nozzle additionally comprising coupling means for connecting the nozzle to a container containing the components of the reactive system.

Advantageously said coupling means comprise a threaded collar received upon the nozzle, said collar being engageable with a correspondingly threaded portion of said container.

The invention relates to a dispensing nozzle as described above for use with a container having two separated compartments for containing respective flowable components of a reactive system and an outlet defining respective separate outlet passages for the two components, which dispensing nozzle comprises an inner conduit disposed within an outer conduit to define two separate co-axial dispensing passages.

Preferably said coupling means connect the nozzle to the container outlet so as to connect the inner and outer dispensing passages to respective ones of the outlet passages of the container.

Conveniently the inner conduit has a rear end formed with an isolating plug comprising a flange adapted to close the outlet of the container and a wedge member projecting from the flange for engagement in one of the outlet passages, the wedge member having a passage therethrough communicating with the inner dispensing chamber and the flange having apertures arranged to place the other outlet passage in communication with the outer dispensing chamber.

In an alternative embodiment two said dispensing passages are defined by the nozzle, the opening of each said passage being spaced axially from the point at which components being dispensed through said passages come into contact with each other, there being provided a partition between said openings which extends from the opening to the point at which said components come into contact with each other, the arrangement being such that respective components discharged through the openings of said passages will pass along separate surfaces of said partition and come into contact with each other at the free end of the partition at the tip of the nozzle.

Preferably said openings are located at adjacent positions axially along the nozzle.

Conveniently said passages are provided in

a side by side arrangement within the nozzle.

Advantageously said partition is of wedge-like configuration and is formed integrally upon one end of the nozzle, the partition tapering in a direction extending away from said openings, said components coming into contact with each other at the thin end of the wedge, said thin ends, constituting the tip of the nozzle.

According to another aspect of this invention there is provided a dispensing nozzle for use with a container having two separated compartments for containing respective flowable components of a reactive system and an outlet defining respective separate outlet passages for the two components which dispensing nozzle comprises an inner conduit disposed within an outer conduit to define separate coaxial dispensing passages, and coupling means for connecting the nozzle to the container outlet, so as to connect the inner and outer dispensing passages to respective ones of the outlet passages of the container.

Preferably the inner conduit has a rear end formed with an isolating plug comprising a flange adapted to close the outlet of the container and a wedge member projecting from the flange for engagement in one of the outlet passages, the wedge member having a passage therethrough communicating with the inner dispensing chamber and the flange having apertures arranged to place the other outlet passage in communication with the outer dispensing chamber.

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

Figure 1 is an axial cross-section through an end portion of a container with which a nozzle embodying the invention is to be used;

Figure 2 is a plan view of the container of Figure 1;

Figure 3 is a perspective view of a first type of dispensing nozzle embodying the invention;

Figure 4 is an underneath view of the dispensing nozzle in Figure 3;

Figure 5 is a side view of the dispensing nozzle of Figure 3;

Figure 6 is a cross-sectional view of the dispensing nozzle taken on the line V-V of Figure 4;

Figure 7 is a front view of the dispensing nozzle of Figure 3;

Figure 8 is a rear view of the dispensing nozzle of Figure 3;

Figure 9 is a perspective view of a second type of dispensing nozzle embodying the invention;

Figure 10 is an end view looking on the left hand end of the nozzle of Figure 9;

Figure 11 is a cross-sectional view taken on the line XI-XI of Figure 10;

Figure 12 is a cross-sectional view taken on the line XII-XII of Figure 10;

Figure 13 corresponds to Figure 10 and shows an end view of a slightly modified version of the second type of nozzle shown in Figure 9;

Figure 14 is a cross-sectional view taken on the line XIV-XIV of Figure 13; and

Figure 15 is a cross-sectional view taken on the line XV-XV of Figure 13.

Referring firstly to Figures 1 and 2, a container for two flowable susbtances constituting the components of a reactive chemical system is moulded from suitable plastics material and comprises a circular end wall 2 from which extend a pair of co-axial cylindrical walls 3 and 4 to define an inner cylindrical chamber 5 and an outer annular chamber 6 each for receiving a respective one of the reactive components.

The end wall 2 is integrally formed with an outlet spigot 7 which camprises a lower cylindrical housing 8 having an axis perpendicular to the axis of the container and an externally threaded cylindrical discharge socket 9 having its axis parallel to the axis of the container. A substantially cylindrical valve body 10 is received in a transverse cylindrical bore extending through the portion 8 of the spigot 7 and is formed with a pair of valve passages 11 and 12 and with a slot 13 by which the valve body may be rotated. In a first position of the valve bady shown in Figure 1, the valve passages 11 and 12 connect respective outlet openings 14 and 15 of the chambers 5 and 6 with respective discharge openings 16 and 17 formed in the floor of the socket 9 which is longitudinally divided into two half sockets of substantially semi-circular cross-section by a central partition 18. The valve body 10 can be rotated through 90° from the position shown in Figure 1 in order to disconnect the outlets 14 and 15 from the openings 16 and 17.

The chambers 5 and 6 are closed at the other end of the container, in known fashion, by movable closure means which are displaced towards the end wall 2 in order to dispense the substances from the container.

Referring now to Figures 3 to 8, a first type of dispensing nozzle for use with the container of Figures 1 and 2 comprises an outer tube 20 having a tapered front end portion 21 and a flared rear end portion 22 on which is received a coupling collar 25 having a flared portion 26 conforming to the shape of the flared end of the tube 20 and an internally threaded cylindrical portion 27 provided with ribs 28 to provide grip. The collar is retained on the flared end portion of the outer tube 20 by retaining pips 29 formed on the tube 20. The cylindrical portion 27 of the coupling sleeve 25 is adapted to be threadedly received on the discharge socket 9 of the container 1, so as to couple the nozzle and the container together.

Received coaxially within the outer tube 20

is an inner tube 30 having a tapered front end 31 and formed at its rear end with a flow isolating plug comprising a frusto-conical flange 32 from which projects a tapered wedge member 33 adapted to be received in one of the two half sockets of the discharge socket 9, so as to close such subsidiary socket. The member 33 has a bore 34 which is aligned with the discharge opening in the floor of the subsidiary socket when the member 33 is inserted into such socket, and which communicates with the inside of the tube 30 so as to conduct the component discharged from the respective chamber of the container into the inner tube 30.

The frusto-conical flange 32 is formed with two notches 35 which are adapted to communicate with the other half socket of the container, so as to conduct the component from the other chamber of the container into the annular passage defined between the inner tube 30 and the outer tube 20.

In use of the described nozzle, to dispense the two components from the container 1, the two components pass separately through the inner and outer discharge passages of the nozzle and emerge as a single extruded bead composed of a cylindrical core of one component and an annular sheath of the other component. This has the advantage of facilitating subsequent mixing of the two components, whilst maintaining the two components in isolated relationship until the moment when the components emerge from the tip of the nozzle.

Figures 9 to 12 illustrate a second type of dispensing nozzle comprising a flared main body 36 of frusto-conical configuration provided at its narrower end with an integrally formed circular-section boss 37. Formed integrally with the main body 36 and the boss 37 is a wedge-like partition 38 which projects from the free end of the boss 37. The wedge-like partition 38 extends diametrally across the free end of the boss 37 and tapers to a thin end 39 which is disposed remote from the free end of the boss 37.

Internally the main body 36 and the boss 37 define two passages 40, 41 through which the components of a reactive system may be dispensed. Each passage, 40, 41 has an opening 42, 43 adjacent the tip of the nozzle, the openings being disposed at the free end of the boss 37 on opposite sides of the wedge-like partition 38, adjacent the base of the partition. The passages 40, 41 extend axially within the nozzle and are positioned in a side by side arrangement.

The end of the nozzle which is not illustrated in Figures 9 to 12 may be substantially the same as that of the nozzle illustrated in Figures 3 to 8. Thus this other end of the nozzle may be provided with coupling means for connecting the nozzle to a container which contains the components of a reactive system such as a reactive system for producing an adhesive.

When the nozzle is connected to the container, the first passage 40 within the nozzle will be connected to a supply of a first component of the system, whilst the second passage 41 will be connected to a supply of a second component of the system. The container for the two components may be substantially the same as if illustrated in Figures 1 and 2. In use the nozzle is connected to the container and the components may be forced from the container along the passages 40, 41 until they reach the openings 42, 43. Continued forcing of the components along the passages 40, 41 will cause the components to emerge from the openings and to pass along opposed surfaces 44, 45 of the partition 38, due to the coanda effect, until they meet at the thin end 39. The thin end 39 of the partition 38 will be positioned at the point where it is desired to apply the product formed by the mixture of the two components. In cases where a high degree of accuracy is required in the application of the end mixture a supplementary tip or nozzle may be fitted over the end of the nozzle. This supplementary nozzle would be in the form of a disposable nozzle. When the flow of components along the passages 40, 41 ceases the components will be withdrawn slightly back into their respective passages. Any excess material may be wiped off the partition 38. There is now a physical barrier between the two components in the form of the partition 38 and the extension thereof back into the nozzle. This barrier between the two components prevents further reaction between the components and therefore renders it possible to use the nozzle on an infrequent or random basis since there is no possibility of excess of the components setting hard at the end of the nozzle.

Figures 13, 14 and 15 correspond to Figures 10, 11 and 12 and illustrate a slightly modified version of the second type of nozzle. The basic components of this modified version are the same as those of the version illustrated in Figures 10, 11 and 12 and are therefore denoted with like reference numerals.

In this modified version of the second type of nozzle the free end of the boss 37 formed on the main body 36 is provided with a chamfer 46, the chamfer 46 forming a single planar face with the faces giving the partition 38 its wedge-like configuration only at its free end. Thus the openings of the passages 40, 41 may be considered to be not at the base of the wedge-like part of the partition, but instead, in the faces of the wedge-like part of the partition. The passages 40, 41 in this modified version are of different configuration to those of Figures 10 to 12, but it will be appreciated that these passages may be of any

convenient configuration.

The modified version shown in Figures 13 to 15 is used and operates in precisely the same manner as described above in relation to Figures 10 to 12.

It will be appreciated that numerous modifications may be made to the specific designs described above without departing from the scope of the present invention.

CLAIMS

1. A dispensing nozzle for use in dispensing flowable components of a reactive system, said nozzle defining a separate, respective dispensing passage for each component, each passage having an opening adjacent a tip of the nozzle, the nozzle being configured such that at least one said opening is spaced axially from a point at which components being dispensed through said passages come into contact with each other.

2. A dispensing nozzle according to claim 1, wherein said dispensing passages are arranged parallel to each other and extend axially within the nozzle.

3. A dispensing nozzle according to claim 1 or claim 2, said nozzle additionally comprising coupling means for connecting the nozzle to a container containing the components of the reactive system.

4. A dispensing nozzle according to claim 3, wherein said coupling means comprise a threaded collar received upon the nozzle, said collar being engageable with a correspondingly threaded portion of said container.

5. A dispensing nozzle according to any one of claims 1 to 4 for use with a container having two separated compartments for containing respective flowable components of a reactive system and an outlet defining respective separate outlet passages for the two components, which dispensing nozzle comprises an inner conduit disposed within an outer conduit to define two separate co-axial dispensing passages.

6. A dispensing nozzle according to claim 5 as dependent upon claim 3, wherein said coupling means connect the nozzle to the container outlet so as to connect the inner and outer dispensing passages to respective ones of the outlet passages of the container.

7. A dispensing nozzle according to claim 6, wherein the inner conduit has a rear end formed with an isolating plug comprising a flange adapted to close the outlet of the container and a wedge member projecting from the flange for engagement in one of the outlet passages, the wedge member having a passage therethrough communicating with the inner dispensing chamber and the flange having apertures arranged to place the other outlet passage in communication with the outer dispensing chamber.

8. A dispensing nozzle according to any one of claims 1 to 4, wherein two said dispensing passages are defined by the nozzle, the opening of each said passage being spaced axially from the point at which components being dispensed through said passages come into contact with each other, there being provided a partition between said openings which extends from the opening to the point at which said components come into contact with each other, the arrangement being such that respective components discharged through the openings of said passages will pass along separate surfaces of said partition and come into contact with each other at the free end of the partition at the tip of the nozzle.

9. A dispensing nozzle according to claim 8, wherein said openings are located at adjacent positions axially along the nozzle.

10. A dispensing nozzle according to claim 8 or claim 9, wherein said passages are provided in a side by side arrangement within the nozzle.

11. A dispensing nozzle according to any one of claims 8 to 10, wherein said partition is of wedge-like configuration and is formed integrally upon one end of the nozzle, the partition tapering in a direction extending away from said openings, said components coming into contact with each other at the thin end of the wedge, said thin ends, constituting the tip of the nozzle.

12. A dispensing nozzle for use with a container having two separated compartments for containing respective flowable components of a reactive system and an outlet defining respective separate outlet passages for the two components, which dispensing nozzle comprises an inner conduit disposed within an outer conduit to define separate coaxial dispensing passages, and coupling means for connecting the nozzle to the container outlet, so as to connect the inner and outer dispensing passages to respective ones of the outlet passages of the container.

13. A dispensing nozzle according to claim 12, in which the inner conduit has a rear end formed with an isolating plug comprising a flange adapted to close the outlet of the container and a wedge member projecting from the flange for engagement in one of the outlet passages, the wedge member having a passage therethrough communicating with the inner dispensing chamber and the flange having apertures arranged to place the other outlet passage in communication with the outer dispensing chamber.

14. A dispensing nozzle substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

15. The combination of a two compartment container and a dispensing nozzle according to any preceding claim.

16. Any novel feature or combination of features disclosed herein.

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