FLUID DISPENSER

INTRODUCTION

[0001] This invention relates to containers for dispensing fluids, most specifically containers which are used for dispensing oil. Most particularly, the invention relates to containers which may be used to dispense oil into the engines of vehicles, especially motor vehicles.

BACKGROUND

[0002] Oil, such as that used in motor vehicles, is often supplied in large, bulky containers. A common preference for the motor industry is that oil is supplied in containers of capacity between 4 and 5 litres, corresponding to the capacity of a typical oil sump for a motor vehicle. When oil is added to the engine of a motor vehicle, the liquid is often dispensed from the container through an aperture located on the engine. However, the mass of such a container, combined with the oil stored within it, means that handling the container can be awkward leading to difficulties when performing the pouring operation and frequently results in spillage. This problem is further exacerbated by the fact that in modern motor vehicles the engine is housed lower in the chassis, thus making it more difficult to access and increasing the likelihood of spillage during the pouring operation.

[0003] In addition, conventional oil containers suffer from further drawbacks. As liquid is discharged from a container, external air enters the container through the liquid dispenser to equalize the pressure difference created by discharge of the liquid. However when large amounts of liquid are poured, the air intake into the container is insufficient or becomes blocked altogether. As a consequence, a pressure difference is generated between the interior and exterior of the container. Due to this pressure difference, when liquid is poured the liquid flows sporadically in an alternating or "glugging" action. Effectively maintaining an appropriate position of incline when handling a conventional 5 litre oil container to overcome this phenomenon, especially when the container is near full capacity, is particularly difficult. If the degree of inclination of the container is too shallow the flow rate of liquid exiting the dispenser will be too low and oil will simply flow down the external container wall. If the degree of inclination is too steep, then the flow rate may be too high and liquid exiting the container may "overshoot" the aperture located on the engine in which the oil is intended to be poured. Given the complex external profile and number of ancillary aspects modern engines exhibit, spillage of oil in the engine compartment may be especially difficult to clean up and may lead to various damaging effects. In addition, an unpleasant smell and smoke resulting from burning oil can arise as the engine heats up.

[0004] Due to the fact that oil is an increasingly rare and valuable commodity and

considering the above-mentioned problems with conventional oil containers, numerous efforts have been made to provide improved oil storage and dispensing means. Simple solutions involve the use of a funnel inserted into the engine aperture prior to pouring. However, use of a funnel may result in contamination from any material or liquid residing on the funnel surface. As such, a cleaning operation is required before pouring can commence.

[0005] Alternatively, other proposed solutions involve the modification of the liquid dispensing means or nozzle to incorporate an air intake portion which may be separated from the liquid discharge portion (see for example WO 94/07756 and GB 2438391). Although such containers overcome the "glugging" phenomena to an extent, containers of this nature fail to provide additional means to control the rate of flow and the accuracy with which liquid is dispensed from the container.

[0006] An improved container for dispensing fluids is therefore needed which overcomes these problems. Specifically a container for a fluid dispenser is needed that can overcome the problem of "glugging" during the pouring operation and provide an improved means to control the rate of flow of fluid as it exits the container.

BRIEF SUMMARY OF THE DISCLOSURE

[0007] According to a first aspect of the present invention there is provided a container comprising:

a fluid reservoir;

a first flow path for dispensing fluid;

a second flow path for permitting the entry of air into the container so that air can communicate with the fluid in the container;

wherein the first flow path and the second flow path are spatially separate; and

a flow control assembly comprising a control means;

wherein the control means is moveable between a first position in which the first flow path and the second flow path are closed and a second position in which the first flow path and the second flow path are open.

[0008] The present invention provides two pathways, one pathway for fluid to be discharged from the container and another independent pathway for air to flow into the container. The provision of the two independent pathways ensures the problem of "glugging" during the pouring operation can be avoided. Furthermore, the inclusion of a flow control assembly provides the container with means operable to accurately control the rate of liquid dispensed during the pouring operation supplemental to that which can be

achieved by simply altering the angle of inclination of the container.

[0009] In typical embodiments of the invention, said flow control assembly comprises an air entry portion and a fluid dispensing portion.

[0010] In one preferred embodiment, fluid in said first flow path cannot communicate with air in said second flow path.

[0011] In an embodiment, the container further comprises a body and one or more neck portions wherein the one or more neck portions connect the flow control assembly to the body. In an embodiment, the flow control assembly is coupled to said one or more neck portions. In an embodiment, the one or more neck portions comprise a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path. In some preferred embodiments, the flow control assembly is configured to define a fluid flow portion from a first neck portion to the fluid dispensing portion for dispensing fluid via the first flow path and an air flow portion from the air entry portion to a second neck portion for the passage of air via the second flow path when the control means is moved to a second position. The inclusion of one or more neck portions comprising fluid flow and air flow portions advantageously ensures that the respective air and liquid flow paths maintain their independence.

[0012] In an embodiment, the container body is shaped so as to define a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path. Shaping of the container body to define a duct obviates the requirement for supplementary features (such as flexible tubing for example) to allow external air to communicate with liquid in the reservoir whilst maintaining separation between the air and fluid flow paths.

[0013] In further preferred embodiments, said flow control assembly comprises a housing. Preferably, the flow control assembly further comprises an inner member mounted in the housing. Preferably, the inner member is moveable in the housing. In further preferred embodiments, the inner member is rotatably mounted in the housing. Preferably, said inner member comprises an orifice adapted to align with an orifice in said housing when said control means is moved to a second position. In such embodiments, ingress of air into the reservoir of the container is facilitated when said orifices are aligned.

[0014] In still further preferred embodiments, said housing comprises a first orifice and a second orifice and wherein fluid from the first flow path is dispensed via said first orifice and air from the second flow path flows through the housing via said second orifice. In preferred embodiments, the inner member comprises a first orifice and a second orifice and wherein said first orifice and said second orifice of the inner member are adapted to

align with said first orifice and said second orifice of the housing when the control means is moved to a second position.

[0015] In further preferred embodiments, the first orifice of the housing has a cross-sectional area greater than the second orifice. Preferably, the first orifice and/or the second orifice of the housing are circular or elliptical. In other embodiments the first orifice and/or the second orifice of the housing are diamond shaped. In preferred embodiments of the invention wherein said flow control assembly comprises a housing and an inner member, the first orifice of the inner member has a cross-sectional area greater than the second orifice of inner member. Preferably, the first orifice and/or the second orifice of the inner member are circular or elliptical. In other embodiments the first orifice and/or the second orifice of the inner member are diamond shaped.

[0016] The container of the present invention comprises control means. In some embodiments the control means are in communication with the inner member. Preferably, the control means are connected to the inner member. In other embodiments, the control means are integral with the inner member.

[0017] Typically the control means of the present invention can be moved to a plurality of different positions. Advantageously, in such embodiments a user can "pre-select" a desired flow rate by moving the control means before commencing the pouring operation. When the pouring operation has been commenced, the control means can be moved further when in the second or "open" position to adjust the rate of fluid flow thereby controlling the rate in which the fluid is dispensed. Preferably, the control means comprises a tap.

[0018] In preferred embodiments, the container of the present invention comprises a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path when the control means is moved to a second position. Preferably the duct terminates proximate the reservoir. The duct may be spatially separate from the reservoir. Advantageously, in such embodiments the duct does not extend into the space defined by the reservoir or the chamber of the reservoir. This ensures the capacity of fluid that can be stored in the reservoir is not adversely impacted.

[0019] In some embodiments of the invention wherein fluid in said first flow path cannot communicate with air in said second flow path, the container comprises a neck portion extending between the flow control assembly and the fluid reservoir, said neck portion comprising a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path.

[0020] In such embodiments wherein fluid in said first flow path cannot communicate

with air in said second flow path and said flow control assembly comprises a housing and an inner member, said inner member comprises an air entry portion and a fluid dispensing portion separated by a fixed member. Thus in such embodiments when the control means is moved to a second position, the air entry portion and the fluid dispensing portion of the inner member align respectively with the air flow portion and the fluid flow portion of the neck portion so as to allow for egress of fluid from and ingress of air into the reservoir. Preferably, said air entry portion and said fluid dispensing portion are formed in said inner member. Thus in such embodiments, the inner member is shaped, moulded or otherwise configured to direct the passage of air and fluid through the inner member.

[0021] In particularly preferred embodiments of the invention, the fluid dispensing portion comprises a fluid outlet and the air entry portion comprises an air inlet wherein the cross-sectional area of the fluid outlet is greater than the cross-sectional area of the air inlet.

[0022] In some alternative embodiments of the invention, fluid in said first flow path is able to communicate with air in said second flow path. In such embodiments, said flow control assembly typically comprises an air entry portion and a fluid dispensing portion which are spaced apart but does not prevent communication between air and fluid from the respective flow paths. Typically (but not exclusively), in such embodiments, said flow control assembly is connected to the reservoir by means of multiple neck portions, most conveniently, two spaced apart neck portions, wherein a first neck portion comprises an air entry portion and a second neck portion comprises a fluid dispensing portion. In said embodiments, the container comprises at least two spaced apart neck portions, including a first neck portion for dispensing of fluid via the first flow path and a second neck portion comprising a duct for the passage of air via the second flow path when the control means is moved to a second position. Thus, in said embodiments, the fluid dispensing portion comprising the fluid outlet and the air entry portion comprising the air inlet are typically distant from each other and may be located at distant ends of said flow control assembly. Advantageously, the positioning of the fluid dispensing portion and the air entry portion in such embodiments ensures the fluid and air flow paths are spaced apart to such an extent that, although communication between air and fluid from the respective flow paths is not prevented, there is no significant interaction between fluid from the first flow path and air from the second flow path. Most conveniently, said fluid outlet is comprised in a nozzle at one end of said flow control assembly, whilst said air inlet is located at a distant end of the assembly.

[0023] In embodiments of the invention comprising a first neck portion for dispensing of fluid via the first flow path and a second neck portion comprising a duct for the passage of air via the second flow path when the control means is moved to a second position and

wherein said flow control assembly comprises a housing and an inner member mounted in said housing, said neck portions may be comprised in said housing and said inner member may comprise separate spaced apart orifices adapted to align with said neck portions such that egress of fluid from and ingress of air into said reservoir is facilitated.

[0024] In further preferred embodiments of the invention, the flow control assembly comprises means to restrict the range of movement of the control means. Optionally, the control means comprises an abutment surface formed therein.

[0025] In embodiments wherein the flow control assembly comprises an inner member, preferably the inner member is inclined at an angle of from 5 to 15 degrees.

[0026] The container of the present invention preferably comprises at least one handle or gripping means. Preferably said handle or gripping means is hollow and defines a portion of said duct. As the handle or gripping means may define a portion of the duct, the construction of the container is simplified. Thus the duct can be integrated within the normal design constraints of a typical fluid dispenser without the dispenser requiring further structural modifications. In further embodiments, said at least one gripping means is juxtaposed to said flow control assembly.

[0027] The container of the present invention is particularly suitable for the dispensing of fluids. Preferably, the fluid is oil. The invention is not however to be limited in this regard and the container of the present invention could be used for dispensing other fluids such as, for example, antifreeze, de-icer, screenwash, fuel treatment fluids and fuel additives.

[0028] Preferably, the container of the present invention comprises a container which is formed from a plastics material. Any plastics material having the required degree of resilience, dimensional stability and resistance to attack by the liquids which are to be placed in the container is suitable for this purpose. Preferably, the plastics material comprises commercially available high density polyethylene (HDPE). In some embodiments, the body of the container is unitary.

[0029] Preferably the capacity of the container is from 3 to 7 litres. Particularly, the capacity of the container is from 4 to 6 litres. Most preferably, the capacity of the container is 5 litres.

[0030] According to a second aspect of the present invention, there is provided a method of dispensing a fluid comprising the steps of:
providing a container according to the first aspect of the invention;
moving the control means to a second position; and
tilting the container to dispense the fluid.

[0031] In a preferred embodiment, there is provided a method of dispensing a fluid according to the second aspect of the invention further comprising the step of:
moving the control means during the dispensing operation to adjust the rate of flow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] Embodiments of the invention are further described hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a front elevation of the container according to a first embodiment of the present invention;

Figure 2 is a perspective view of a neck of the container according to a first embodiment of the invention;

Figure 3 is a cross-sectional view of the flow control assembly according to a first embodiment of the present invention;

Figure 4 is a cross-sectional view of the inner member of the flow control assembly according a first embodiment of to the present invention;

Figure 5 is a front view of the flow control assembly according to a first embodiment of the present invention;

Figure 6 is a front elevation of the container according to a second embodiment of the present invention;

Figure 7 is a cross-sectional view of the flow control assembly according to a second embodiment of the present invention;

Figure 8 is a cross-sectional view of the inner member of the flow control assembly according to a second embodiment of the present invention.

Figure 9 is a front elevation of the container according to a third embodiment of the present invention;

Figure 10 is A) a plan view and B) a side view of a neck of the container according to a third embodiment of the invention;

Figure 11 is a cross-sectional view of the flow control assembly according to a third embodiment of the present invention;

Figure 12 is an exploded view of the flow control assembly according to a third embodiment of the present invention;

Figure 13 is a cross-sectional view of the flow control assembly according to a third embodiment of the present invention in A) a closed position and B) an open position.

DETAILED DESCRIPTION

[0033] Referring to Figure 1, there is a container (100) for dispensing fluids which comprises a reservoir (10) and a neck (11) for fluid to flow between the reservoir (10) and a dispensing nozzle (14) when the container is suitably tilted. The body (90) of container (100) comprises the reservoir (10). Situated on top of the container (100) is a flow control assembly (20) which is connected to the body (90) and reservoir (10) via neck (11). Alternatively, or in addition, the flow control assembly (20) may be connected to the body (90) and reservoir (10) by any suitable attachment means. Container (100) is provided with a gripping portion such as a handle (16) to assist with the fluid dispensing operation. Handle (16) comprises a hollow interior and defines a portion of a duct (18) which extends from the flow control assembly (20) and through neck (11). Duct (18) may be separated from the reservoir (10) by a pinched section or dividing wall (19). Fluid dispensing nozzle (14) may include a threaded portion onto which a cap (15) can be screwed when the container (100) is not required for any dispensing operation. The fluid dispensing nozzle (14) and cap (15) may have additional safety features to ensure the cap (15) cannot easily be removed by children (such a cap and nozzle arrangement will be familiar to those of skill in the art). Container (100) may comprise other features to improve its aesthetic appearance. For example, container (100) may also comprise a member (21) disposed between the flow control assembly (20) and the reservoir (10). In an embodiment, the member (21) resides between a top portion of the body of container (100) above reservoir (10) and a portion of the flow control assembly (20) distal to the nozzle (14). As the member (21) is an aesthetic feature of the container (100) it performs no functional purpose.

[0034] Referring to Figure 2 and Figure 3, the flow control assembly (20) is connected to the body (90) and reservoir (10) by a neck portion (11). Neck portion (11) is divided into a fluid flow portion (12) comprising a first channel (12a) for flow of fluid and an air flow portion (13) comprising a second channel (13a) for passage of air. Fluid flow portion (12) and air flow portion (13) are linked by a fixed member (11a). Neck (11) enables connection of the flow control assembly (20) to the body (90) and reservoir (10) by engagement of respective threaded portions on the fluid flow portion and air flow portion (11b, 11c) with a corresponding threaded portion (29a) on the interior of a collar (29) disposed between the body (90) and reservoir (10) and the flow control assembly (20).

[0035] With reference to Figure 3, the flow control assembly (20) comprises a housing (22), inner member (30), control means (50), nozzle (14), air inlet (38) and a fluid outlet (40). Nozzle (14) may be integrally formed as part of the housing (22) or connected to the housing (22). The housing (22) may comprise a generally cylindrical tube having a first end proximate the nozzle (14) and a second end proximate the control means (50). The housing (22) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, housing (22) is constructed from a plastic material such as high-density polyethylene. Typically, the length of the housing (22) is from 100 mm to 120 mm with a diameter of from 30 mm to 40 mm. The housing (22) further comprises a first orifice (24) and a second orifice (26) formed in housing wall (22a). It is preferred that the first and second orifices (24, 26) are formed in a portion of the wall (22a) nearest the reservoir (10). The first orifice (24) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (24) may be diamond shaped. The second orifice (26) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (26) may be diamond shaped. However, the skilled person will appreciate that the first orifice (24) and the second orifice (26) may adopt a variety of shapes and that the invention is not to be limited in this regard. The cross-sectional area of the first orifice (24) is sufficiently sized so that, in use, when the container (100) is suitably tilted fluid can be transferred effectively from the reservoir (10), through the first orifice (24) and out through the nozzle (14). The cross-sectional area of the first orifice (24) is preferably larger than the cross-sectional area of the second orifice (26). Typically, the cross-sectional area of the first orifice (24) will be at least twice that of the second orifice (26). In one embodiment the cross-sectional area of the first orifice (24) is three times that of the second orifice (26). In another embodiment, the cross-sectional area of the first orifice (24) is four times that of the second orifice (26). Flow control assembly (20) further comprises a fluid flow portion (27) and an air flow portion (28). Fluid flow portion (27) and air flow portion (28) extend from housing (22) and are respectively coincident with the first orifice (24) and the second orifice (26). Conveniently, fluid flow portion and air flow portion (27, 28) may be formed out of the same material as the housing (22). Fluid flow portion (27) is defined by wall (27a) and air flow portion (28) by wall (28a). Fluid flow portion (27) and air flow portion (28) are separated in space by wall portion (22b) of the housing (22). Typically, fluid flow portion and air flow portion (27,28) of the flow control assembly (20) are aligned with the fluid flow portion and air flow portion (12,13) of the neck portion (11) of container (100).

[0036] In embodiments wherein the housing (22) comprises a generally cylindrical tube, the cross-sectional area of the housing (22) may be constant throughout the length of the tube. In other embodiments, the housing (22) may have a cross-sectional area greater at

one end. In one embodiment, the second end of the housing (22) proximate the flow control means (50) has a cross-sectional area greater than the first end of the housing (22) proximate the fluid dispensing means (14). In one embodiment the housing (22) may be outwardly tapered in the direction of the control means (50).

[0037] Referring to Figures 3 and 4, the inner member (30) is adapted to be mounted in the housing (22). Accordingly, the outer profile of the inner member (30) is shaped so as to generally conform to the inner profile of the housing (22). Thus when the housing (22) is generally cylindrical, the outer profile of inner member (30) will also be generally cylindrical. Thus in one embodiment, the inner member (30) may comprise a generally cylindrical member with a tubular portion. Conveniently, inner member (30) may have a diameter which is slightly less than the housing (22) so that inner member (30) can be mounted in the housing (22) by a tight friction fit. However, the nature of the fit is such that the inner member (30) is moveable in the housing (22). In a preferred embodiment, inner member (30) is rotatably moveable in the housing (22). Typically, the length of the inner member (30) is from 100 mm to 120 mm with a diameter of 30 mm to 40 mm. Suitably, in embodiments wherein the inner member (30) is adapted to be mounted in housing (22), the length and diameter of the inner member (30) are less than the length and diameter of the housing (22).

[0038] The inner member (30) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, inner member (30) is constructed from a plastic material such as high-density polyethylene. The inner member (30) comprises a wall (30a), an air entry portion (38a), a fluid discharge portion (40a), a fixed member (39), a first orifice (34) and a second orifice (36). Suitably, the inner member (30) may be shaped so that fluid discharge portion (40a) and air entry portion (38a) are integrally formed therein. Fluid discharge portion (40a) extends from fluid outlet (40) and air entry portion (38a) extends from air inlet (38). Thus fluid discharge portion (40a) and air entry potion (38a) extend within the body of inner member (30). As shown in Figures 3 and 4, said air entry portion (38a) comprises a channel defined between fixed member (39) and wall (30a). Said channel extends within the inner member (30) leading to a chamber (35) with an internal space greater than the volume of the air entry portion (38a).

[0039] The first orifice (34) of the inner member (30) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (34) may be diamond shaped. Although the first orifice (34) may be formed in a variety of different shapes, in a much preferred embodiment the first orifice (34) of the inner member complements the shape of the first orifice (24) of the housing (22). The second orifice (36) of the inner member (30)

may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (36) may be diamond shaped. As with the first orifice, it is preferred that the second orifice (36) of the inner member (30) complements the shape of the second orifice (26) of the housing (22). Typically, the diameters of the first and second orifices (34, 36) of the inner member (30) will be the same as the respective first and second orifices (24, 26) of the housing (22).

[0040] The inner member (30) has a first end proximate the nozzle (14) and a second end proximate the flow control means (50). A fixed member (39) or dividing wall separates fluid discharge portion (40a) and air entry portion (38a). The fixed member (39) extends upwardly from a portion of the wall (30b) of the inner member (30) located between the first orifice (34) and the second orifice (36) and terminates at the first end proximate the nozzle (14). The fixed member (39) may be curved in the region immediately above the first orifice (34). Advantageously, the curvature of the fixed member (39) in this region facilitates the smooth movement of fluid towards the fluid outlet (40) after exiting the first orifice (34) when the container (100) is tilted steeply. As depicted in Figure 5, the cross-sectional area of the fluid outlet (40) is preferably greater than the cross-sectional area of the air inlet (38). Typically, the cross-sectional area of fluid outlet (40) is at least twice that of the air inlet (38). In one embodiment, the cross-sectional area of the fluid outlet (40) is three times the cross-sectional area of the air inlet (38). In another embodiment, the cross-sectional area of the fluid outlet (40) is four times the cross-sectional area of the air inlet (38). Furthermore, the internal space comprised in the fluid discharge portion (40a) is preferably greater than that of the air entry portion (38a). As such, the greater internal space of the fluid discharge portion (40a) achieved by the shaping of the inner member (30) ensures that the volume of fluid that can be discharged is minimally impacted by the division of the nozzle region (14) of the container into a separate fluid discharge portion (40a) and air entry portion (38a).

[0041] The control means (50) of the flow control assembly (20) is preferably located at an end distal to the nozzle (14). The control means may include engagement means such as an arm, a lever or turning means. In a preferred case, the control means (50) conveniently comprises a tap (51). The tap (51) may comprise equidistantly displaced ridges (51a) to aid gripping and rotation. Control means (50) may be formed integrally with the inner member (30) or may be a separate component which communicates with the inner member (30). In the arrangement whereby the control means (50) communicates with the inner member (30), control means (50) may be connected or attached to the inner member (30) by any suitable means. In some embodiments, projections or ribs formed on the interior of the control means (50) may engage corresponding crevices or slots in the

exterior of the inner member (30) to enable rotation thereof. In other embodiments, the inner member (30) comprises projections or fins which may engage corresponding slots formed in the control means (50) to enable rotation thereof. In further embodiments, the control means (50) may be slidably engageable with the inner member (30). Thus the control means (50) may be moveable by sliding between a forward and backward position. When the control means (50) is in the forward position and engaged with the inner member (30), the control means (50) may be rotatably moveable to effect a rotational movement of both the control means (50) and the inner member (30). Alternatively, the control means (50) may be adapted so that a portion fits within the inner member (30). In this embodiment, the control means (50) may comprise a cylindrical portion (52) with a diameter less than that of inner member (30) so that the cylindrical portion (52) can fit inside the tube of inner member (30). Alternatively, or in addition, the inner member (30) may be adapted for the insertion of the control means (50). For example, the inner member (30) may be outwardly tapered or a linear section of the tube of the inner member (30) may have a larger cross-sectional area to accommodate the control means (50). In all embodiments, the control means (50) is moveable with respect to the housing (22) and in preferred embodiments, the control means is rotatably moveable with respect to the housing (22).

[0042] The control means (50) is moveable by engagement of a lever, arm or a turning means. In the preferred case wherein the control means (50) comprises a tap (51), it is moveable by rotation thereof. In embodiments wherein the control means (50) communicates with the inner member (30), movement of the control means (50) causes a consequent movement of the inner member (30). A portion of the control means (50) may be adapted to be mounted in the housing (22) using the same means by which the inner member (30) is mounted in the housing (22). For example, the housing (22) may be outwardly tapered or a linear section of the tube of the housing (22) may have a larger cross-sectional area to accommodate the control means (50). The control means (50) is moveable through a range of different positions including at least one closed position and at least one open position. Suitable markings or indicia may be provided on an appropriate part of the control means (50), flow control assembly (20) and/or container (100) to indicate the respective open and closed positions (or any intermediate positions). When the control means (50) includes a turning means or tap (51), it may be rotated through 360°. As such, the flow control assembly (20) can adopt a number of different "open" positions which can be used to control the flow rate of fluid when it is dispensed from the container (100). Control means (50) may further comprise additional features to limit the maximum flow rate. For example, control means (50) may comprise a projection or abutment surface formed therein which, once moved beyond a certain position, abuts a

corresponding projection or abutment surface to prevent any further movement of the control means (50). The control means (50) may therefore include a pip that abuts a corresponding pip formed on the internal wall of the inner member (30) or the housing (22) to prevent further rotation. In another embodiment, the pip or abutment surface may be dimensioned so that further movement or rotation of the control means (50) is merely restricted and not prevented entirely. If therefore the user applies additional torque or force to the tap or turning means then the resistance may be overcome and further movement will be permitted. In addition, the container (100) may comprise one or more features to prevent movement of the control means (50) when fluid is not to be dispensed from the container (100). For example, the control means (50) may be moveable between a forward position and a backward position. In such embodiments, the first and second flow paths may only be opened by an additional movement of the control means (for example, by rotation thereof) when the control means (50) has been placed in a forward position. Thus, when the control means is in a backward position rotation of the control means is prevented and the first and second flow paths cannot be opened. The control means may be slidably moveable between forward and backward positions.

[0043] In some alternative embodiments, the container of the present invention may comprise more than one neck connecting the flow control assembly to the reservoir. With reference to Figure 6, container (100A) comprises a first neck portion (12A) and a second neck portion (12B). Flow control assembly (20A) is connected to the reservoir (10A) via first and second spaced apart neck portions (12A, 12B). Alternatively, or in addition, the flow control assembly (20A) may be connected to the reservoir (10A) by any suitable attachment means. Container (100A) is provided with a gripping portion such as a handle (18A), optionally situated between the reservoir (10A) and the flow control assembly (20A), to assist with the fluid dispensing operation. Container (100A) also comprises tubular member (16B) extending from second neck portion (12B). Tubular member (16B) may also serve as a gripping portion so that a user may conduct the pouring operation by gripping the container (100A) at its side as well as from above. Tubular member (16B) is connected to reservoir (10A) by lower joining portion (16Aa) and upper joining portion (16Ab). The container (100A) further comprises a fluid dispensing nozzle (14A) which may be formed integrally with the flow control assembly (20A). Alternatively, fluid dispensing nozzle (14A) may be a separate component adapted to be inserted into a portion of the flow control assembly (20A) or may be attached to the flow control assembly (20A) by any suitable means. Fluid dispensing nozzle (14A) may include a threaded portion onto which a cap (15A) can be screwed when the container (100A) is not required for any pouring operation.

[0044] With reference to Figure 7, the flow control assembly (20A) in such embodiments comprises a housing (22A), inner member (32A), control means (50A), fluid outlet (40A), fluid discharge portion (40Aa), air entry portion (33A) and an air inlet (38A). Fluid outlet (40A) and air inlet (38A) are typically located at distant ends of said flow control assembly (20A). Fluid outlet (40A) is comprised in dispensing nozzle (14A) at a first end of flow control assembly (20A). Housing (22A) has a first end proximate the dispensing nozzle (14A) and a second end proximate the control means (50A). The housing (22A) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, housing (22A) is constructed from a plastic material such as high-density polyethylene. Typically, the length of the housing (22A) is from 100 mm to 120 mm with a diameter of from 30 mm to 40 mm. The housing (22A) may be an elongate generally cylindrical tube. The housing (22A) further comprises a first orifice (24A) and a second orifice (26A) formed in housing wall (22Aa). It is preferred that the first and second orifices (24A, 26A) are formed in a portion of the wall (22Aa) nearest the reservoir (10A). The first orifice (24A) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (24A) may be diamond shaped. The second orifice (26A) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (26A) may be diamond shaped. However, the skilled person will appreciate that the first orifice (24A) and second orifice (26A) may adopt a variety of shapes and that the invention is not to be limited in this regard. The cross-sectional area of the first orifice (24A) is preferably larger than the cross-sectional area of the second orifice (26A).Typically, the cross-sectional area of the first orifice (24A) will be at least twice that of the second orifice (26A). In one embodiment, the cross-sectional area of the first orifice (24A) is three times that of the second orifice (26A). In another embodiment, the cross-sectional area of the first orifice (24A) is four times that of the second orifice (26A).

[0045] In one example of such embodiments, the wall of the housing (22Aa) is linear. Hence, the cross-sectional area of the housing (22A) may be constant throughout the length of the tube. In other embodiments, the housing (22A) may have a cross-sectional area greater at one end. In a preferred case, a second end of the housing (22A) proximate the flow control means (50A) has a cross-sectional area greater than the first end of the housing (22A) proximate the fluid dispensing means (14A). In one embodiment the housing (22A) may be outwardly tapered in the direction of the control means (50A). In a particularly preferred embodiment, the second end of the housing (22A) proximate the control means (50A) comprises a shoulder portion (23A). The shoulder portion (23A) is formed from a section of the housing wall (22Aa) which, instead of adopting a continuous linear path, curves outwardly before resuming a linear path to create a "bulge" in the region of the second end of the housing proximate the control means (50A). In a

preferred aspect of this embodiment, the shoulder portion (23A) is formed in a portion of the housing wall (22Aa) distanced furthest from the reservoir (10A).

[0046] Referring to Figures 7 and 8, the inner member (32A) of flow control assembly (20A) is adapted to be mounted in housing (22A). Conveniently, inner member (32A) may have a diameter which is slightly less than housing (22A) so that inner member (32A) can be mounted in the housing (22A) by a tight friction fit. However, the nature of the fit is such that the inner member (32A) is moveable in the housing (22A). As such, inner member (32A) is shaped so as to generally conform to the inner profile of the housing (22A). Thus when housing (22A) is generally cylindrical, inner member (32A) will also be cylindrical. In a preferred case, inner member (32A) is rotatably moveable in the housing (22A). Typically, the length of the inner member (32A) is from 100 mm to 120 mm with a diameter of 30 mm to 40 mm. Suitably, in embodiments wherein the inner member (32A) is adapted to be mounted in housing (22A), the length and diameter of the inner member (32A) are less than the length and diameter of the housing (22A).

[0047] The inner member (32A) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, inner member (32A) is constructed from a plastic material such as high-density polyethylene. Inner member (32A) has a first end proximate the dispensing nozzle (14A) and a second end proximate the control means (50A). Preferably inner member (32A) is tubular. The cross-sectional area of inner member (32A) may be constant throughout the length of the tube. Alternatively, the inner member (32A) may have a cross-sectional area that is greater at one end. In one embodiment the end of the inner member (32A) with greater cross-sectional area is outwardly tapered to facilitate insertion of the control means (50A). In another embodiment, a linear section of the tube may have a larger cross-sectional area to accommodate the control means (50A). The inner member (32A) further comprises a first orifice (34A) and a second orifice (36A). The first orifice (34A) of the inner member (32A) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (34A) may be diamond shaped. Although the first orifice (34A) may be formed in a variety of different shapes, in a much preferred embodiment the first orifice (34A) of the inner member (32A) will compliment the shape of the first orifice (24A) of housing (22A). The second orifice (36A) of the inner member (32A) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (36A) may be diamond shaped. As with the first orifice, it is preferred that the second orifice (36A) of the inner member (32A) compliments the shape of the second orifice (26A) of housing (22A). Typically, the diameters of the first and second orifices (34A, 36A) of the inner member (32A) will be the same as the respective first and second orifices (24A, 26A) of the

housing (22A). Inner member (32A) may further comprise an air inlet (38A) formed in a portion of the wall (32Aa). In a preferred case, the air inlet (38A) is formed in a portion of the wall of the inner member (32A) at the second end proximate the control means (50A). In a further preferred aspect of this embodiment, the air inlet (38A) is formed in a portion of the wall (32Aa) opposed to the second orifice (36A).

[0048] The flow control assembly (20A) further comprises control means (50A) which includes engagement means such as an arm, a lever or turning means. In a preferred embodiment, the control means (50A) conveniently comprises a tap (51A). In such embodiments, control means (50A) and tap (51A) may comprise substantially the same features as in the first embodiment of the invention as hereinbefore described with reference to Figures 1 to 5. Thus, control means (50A) may be formed integrally with the inner member (32A) or may be a separate component which communicates with the inner member (32A). In the arrangement whereby the control means (50A) communicates with the inner member (32A), control means (50A) may be connected or attached to the inner member (32A) by any suitable means. Alternatively, control means (50A) may be adapted so that a portion fits within the inner member (32A). In this embodiment, the control means (50A) may comprise a cylindrical portion (52A) with a diameter less than that of inner member (32A) so that the cylindrical portion (52A) can fit inside the tube of inner member (32A). Alternatively, or in addition, the inner member (32A) may be adapted for the insertion of the control means (50A). For example, the inner member (32A) may be outwardly tapered or a linear section of the tube of the inner member (32A) may have a larger cross-sectional area to accommodate the control means (50A). In all embodiments, the control means (50A) is moveable with respect to the housing (22A) and in preferred embodiments, the control means is rotatably moveable with respect to the housing (22A).

[0049] The flow control assembly (20A) further comprises at least one air inlet (38A) so that external air can communicate with the fluid in the container (100A). In a preferred case, air is only permitted to enter the air inlet (38A) when the control means (50A) is moved to an open position. In a particularly preferred embodiment, the air inlet (38A) is formed in the wall (32Aa) of the inner member (32Aa) or the wall (50Aa) of the cylindrical portion of the control means (50A). In this preferred arrangement, the second end of the housing (22A) proximate the control means (50A) has a greater cross sectional area than the first end of the housing proximate the fluid dispensing means (14A). As such, a portion of the wall of the housing (22A) near the second end is shaped so that the wall of the inner member (32A) or the wall of the cylindrical portion of the control means (52A) is not in contact with the wall of the housing (22A) in this region. An air entry portion (33A) created by a recess or gap is thus present between the wall of the housing (22A) and the wall of

the inner member (32A) or the wall of the cylindrical portion of the control means (52A). The air inlet (38A) formed in the inner member (32A) or the control means (50A) is coincident with the recess or gap of the air entry portion (33A) when the control means (50A) is moved to an open position. In a particular preferred aspect of this embodiment the second end of the housing (22A) proximate the control means (50A) comprising the air entry portion (33A) is formed by shoulder portion (23A).

[0050] In another alternative embodiment wherein air is only permitted to enter the air inlet (38A) when the control means (50A) is moved to an open position, the air inlet (38A) may be formed in the wall of inner member (32Aa) or the wall of the cylindrical portion of the control means (50Aa) and an additional air inlet may be formed in the housing (22A). When the control means (50A) is moved to an open position, the further air inlet in the housing (22A) has at least a portion which overlaps with the air inlet (38A) formed in the inner member (32A) or the control means (50A) such that air can enter and communicate with the internal space of the inner member (32A).

[0051] In other arrangements, an air inlet (not shown in the Figures) may be formed in a portion of the control means (50A) which is not enclosed by the housing (22A) or inner member (32A). In these particular embodiments, air can enter through said air inlet and communicate with the internal space of the inner member (32A) when the control means (50A) is in any position (i.e. closed or open).

[0052] Further embodiments of the container of the invention are shown in Figures 9 to 13. Referring to Figure 9, there is a container (100B) for dispensing fluids which comprises a body (90B), a reservoir (10B) and a neck (11A) for fluid to flow between the reservoir (10B) and a fluid dispensing nozzle (14B). Fluid dispensing nozzle (14B) may include a threaded portion onto which a cap (15B) can be screwed when the container (100B) is not required for any pouring operation. The container (100B) includes a flow control assembly (20B) which is connected to the body (90B) via neck (11A). Container (100B) is provided with one or more gripping means such as handles (16B and 16C) to assist with the fluid dispensing operation. In the embodiment shown in Figure 9, a first gripping means (16C) is located at an upper section of the container adjacent to the flow control assembly (20B) and a second gripping means (16B) is located at a mid-section of the container adjacent to and spaced apart from the reservoir (10B). At least one portion of the one or more gripping means (16B) comprises a hollow interior and defines a portion of a duct (18B) which extends from the flow control assembly (20B), through neck (11A) and terminates at reservoir (10B). Duct (18B) may be separated from the reservoir (10B) by a pinched section or dividing wall (19B). Duct (18B) comprises a first section that extends through the flow control assembly (20B) and a second section that extends through neck (11A).

The container (100B) further comprises a communicating member (12E) linking the neck (11A) and handle 16(B). The communicating member (12E) defines a connecting channel which comprises a middle section (18Ba) of the duct (18B). The connecting channel may be integrally formed as part of body (90B). Thus the body (90B) may be shaped or moulded to include the duct (18B). The hollow portion of gripping means or handle (16B) defines the end section (18Bb) of the duct (18B). Handle 16B is connected to the reservoir (10B) by a joining portion (16Ba). In certain embodiments, the duct (18B) may not extend into the reservoir (10B) and may terminate at a position coincident with the joining portion (16Ba).

[0053] With reference to Figure 9 and Figure 10A) and B), the neck (11A) comprises a first neck portion (12C) and a second neck portion (12D). The first and second neck portions (12C, 12D) are linked and spaced apart by a fixed member (11Ba) and protrude upwardly from container body (90B). The first neck portion (12C) comprises a fluid flow portion (12Ca) defining a first channel for flow of fluid. The second neck portion (12D) comprises an air flow portion (12Da) defining a second channel for passage of air.

[0054] Referring now to Figure 11, the flow control assembly (20B) in accordance with the third embodiment of the invention is depicted. In many respects, the flow control assembly (20B) of the third embodiment of the invention is similar to the flow control assembly of the first embodiment of the invention as hereinbefore described with reference to Figures 1 to 5. The flow control assembly (20B) thus comprises a housing (22B), inner member (30B), flow control means (50B), nozzle (14B), air inlet (38) and a fluid outlet (40). The features of the nozzle (14B) and the housing (22B) equate to those described in relation to the first embodiment of the invention. The housing (22B) further comprises a first orifice (24B) and a second orifice (26B) formed in housing wall (22Ba) with features similar to those described with respect to the first embodiment of the invention. Flow control assembly (20B) further comprises a fluid flow portion (27B) and an air flow portion (28B). Fluid flow portion (27B) and air flow portion (28B) extend from housing (22B) and are respectively coincident with the first orifice (24B) and the second orifice (26B). Conveniently, fluid flow portion and air flow portion (27B, 28B) may be formed out of the same material as the housing (22B). Fluid flow portion (27B) is defined by wall (27Ba) and air flow portion (28B) by wall (28Ba). Fluid flow portion (27B) and air flow portion (28B) are separated in space by wall portion (22Bb) of the housing (22B). Typically, fluid flow portion and air flow portion (27B, 28B) of the flow control assembly (20B) are aligned with the first neck portion (12C) and second neck portion (12D) of the container (100B).

[0055] The housing (22B), and therefore the flow control assembly (20B), may be

attached to neck (11A) and the body (90B) of the container (100B) by coupling means. For example, housing (22B) may contain coupling members (27C and 28C) to enable attachment to the first and second neck portions (12C, 12D). As shown in Figure 12, washers (13A and 13B) may be included between the coupling members and the first and second neck portions. The coupling means allow the housing (22B), and thus the flow control assembly (20B), to be clipped or "snap fitted" to the body (90B) of the container.

[0056] With reference to Figures 11 and 12, the third embodiment of the invention may comprise a flow control assembly (20B) containing an inner member (30B) with the same features as those described with respect to the first embodiment of the invention. Thus the inner member (30B) has a first end proximate the nozzle (14) and a second end proximate the flow control means (50B). The inner member (30B) comprises a fluid discharge portion (40Ba) and an air entry portion (38Ba). The inner member (30B) also comprises a first orifice (34B) and a second orifice (36B). The inner member (30B) may further comprise a chamber (35B). The fluid discharge portion (40Ba) is separated from air entry portion (38Ba) by a fixed member or dividing wall (39B). The fixed member (39B) extends upwardly from a portion of the wall (30Bb) of the inner member (30B) located between the first orifice (34B) and the second orifice (36B) and terminates at the first end proximate the nozzle (14B). The fixed member (39B) may be curved in the region above the first orifice (34B) as described in relation to the first embodiment of the invention. Alternatively, the fixed member (39B) may be substantially linear in the region above the first orifice (34B) and instead comprise two intersecting linear walls such as is shown in Figure 11.

[0057] In other embodiments of the inner member (30B), the region depicted as the chamber (35B) in Figure 11 may alternatively comprise a vertically extending channel which projects upwardly from the second orifice (36B) and intersects with the air entry portion (38Ba). Thus in some embodiments the inner member (30B) may comprise a longitudinal channel and a vertical channel formed therein. The region depicted as chamber (35B) may therefore be substantially solid aside from said longitudinal channel and said vertical channel. When the control means (50B) is moved to an open position the vertical channel defines a pathway through the air flow portion of the flow control assembly (28B) and the second neck portion (12D).

[0058] In further embodiments, the inner member (30B) may comprise a first orifice (34B) and a second orifice (36B) wherein the circumference or perimeter each respectively defining the first orifice (34B) and/or the second orifice (36B) comprises at least one curved edge and at least one straight edge. In certain embodiments, the circumference or perimeter defining the first orifice (34B) comprises at least one curved edge and two straight edges. In such embodiments, a portion of the first orifice (34B) may

be substantially V-shaped. Such a configuration enables enhanced control of fluid flow as the inner member (30B) moves with the control means (50B) to an open position. In further embodiments, the second orifice (36B) is elongated such that it comprises a slot.

[0059] The third embodiment of the invention may comprise a control means (50B) with the same features as described in relation to the first embodiment of the invention. With reference to Figure 13, the container (100B) in accordance with the third embodiment of the invention is shown with the flow control assembly (20B) in a closed position (see Figure 13A)) and in an open position (see Figure 13B)). Furthermore, the container (100B) may comprise supplementary features proximate the control means (50B). For example, the region of the handle 16C adjacent to the control means (50B) may comprise a stump 21B such as that depicted in Figure 12. Handle 16C may be proximate or juxtaposed to the control means (50B) and flow control assembly (20B). The positioning of the handle 16C and inclusion of the stump (21B) may provide further structural reinforcement and stability to the flow control assembly (20B).When the container (100B) includes a stump (21B), the interior of the handle 16C may be hollow or solid.

[0060] In all embodiments of the invention, the reservoir (10, 10A, 10B) of the container (100, 100A, 100B) comprises a chamber (10a, 10Aa, 10Ba) for the storage of fluids, preferably oil. In a preferred case, the capacity of the container (100, 100A, 100B) is 5 litres. However, the capacity of the container (100, 100A, 100B) is not to be limited in this regard and the reservoir (10, 10A, 10Ba) could be adapted such that the capacity of the container is, for example, 2L, 3L, 4L, 6L, 7L or, alternatively, a container of any given capacity which is designed to be handled by a user and has a sufficient volume to exacerbate the "glugging" phenomenon resulting from the ingress of air as fluid leaves the container during the pouring operation. The body (90, 90A, 90B) and reservoir (10, 10A, 10Ba) of container (100, 100A, 100B) is formed from a plastics material. Any plastics material having the required degree of resilience, dimensional stability and resistance to attack by the fluids to be placed in the container (100, 100A, 100B) are suitable for this purpose. Suitable plastic materials include, for example, high-density polyethylene. Typically, the body (90,90A, 90B) and reservoir (10, 10A, 10B) is manufactured by blow moulding. In some embodiments, the body (90, 90A, 90B) of the container may be unitary. Additionally, the container of the invention may include one or more tamper evident features. For example, the control means (50, 50A, 50B) may incorporate a tamper evident tab.

[0061] In embodiments of the invention comprising more than one neck connecting the flow control assembly (20A) to the reservoir (10A), such as described in relation to the second embodiment of the invention with reference to Figures 6 to 8, tubular member

(16B) defines a portion of a duct (17A), along which both air and fluid can flow (See Figure 6). The duct (17A) is connected to the reservoir (10A) by lower joining portion (16Aa) and upper joining portion (16Ab). Lower and upper joining portions (16Aa and 16Ab) may respectively comprise a hollow portion so that fluid can flow between the reservoir (10A) and the duct (17A). The hollow portion within the joining portions (16Aa and 16Ab) also permits air to flow from the duct (17A), through the joining portions and to the reservoir (10A). In one embodiment, only the lower joining portion (16Aa) comprises a hollow portion. In another aspect of this embodiment, the upper joining portion (16Ab) is crimped.

[0062] The container (100, 100A, 100B) in accordance with the invention provides an improved means for controlling the flow of fluid dispensed. In the first and third embodiments of the invention, operation of the device is commenced by first unscrewing the cap (15, 15B) and rotating the tap (51, 51B) of the control means (50, 50B) to an open position. Movement of the control means (50, 50B) to an open position causes a simultaneous movement of the inner member (30, 30B) so that a portion of the respective first and second orifices (34, 34B and 36, 36B) of the inner member (30, 30B) overlap with a portion of the respective first and second orifices (24, 24B and 26, 26B) of the housing (22, 22B). External air flows through the air inlet (38) and along the channel defined by the air entry portion (38a) into the internal space defined by chamber (35, 35B) of the inner member (30, 30B). In some embodiments, air flows through a longitudinal channel and a vertical channel formed in the inner member (30, 30B). Air then flows through a through-hole (46, 46B) created by the overlap of the second orifice (36, 36B) of the inner member (30, 30B) and the second orifice (26, 26B) of the housing (22, 22B) and through the respective air flow portions (28, 28B and 13, 12D) of flow control assembly (20, 20B) and neck (11, 11A) via channel (13a, 12Da) which defines a portion of the duct (18, 18B). In some embodiments, the air flows along connecting member (12E) via the mid-section (18Ba) of duct (18B) within the body of the container before entering the hollow portion of the handle (16, 16B). Air continues to flow along duct (18, 18B), through the hollow portion of the handle (16, 16B) and into the reservoir (10, 10B). A portion of the air flow path from the external atmosphere, to the reservoir (10, 10B) is thus shown in Figures 3 and 11 by arrow A.

[0063] When a pouring operation is commenced, fluid from the reservoir (10, 10B), flows along the respective fluid flow portions (27, 27B and 12, 12Ca) of flow control assembly (20, 20B) and neck (11, 11A), through a through-hole (44, 44B) created by the overlap of the first orifice (34, 34B) of the inner member (30, 30B) and the first orifice (24, 24B) of the housing (22, 22B). Fluid then flows along the fluid dispensing portion (40a, 40Ba) and out through the fluid outlet (40). In some embodiments, if the tilting of container (100) is

sufficiently steep, the fluid will flow against the curved portion of dividing wall (39) before being directed along the fluid dispensing portion (40a) and out through the fluid outlet (40). A portion of the fluid flow path from the reservoir (10, 10B) is shown in Figure 3 and Figure 11 by arrow B.

[0064] In embodiments of the invention comprising more than one neck connecting the flow control assembly (20A) to the reservoir (10A) such as those described with reference to Figures 6 to 8, operation of the device is commenced by first unscrewing the cap (15A) and rotating the tap (51A) of the control means (50A) to an open position. Movement of the control means (50A) to an open position causes a simultaneous movement of the inner member (32A) so that a portion of the respective first and second orifices (34A, 36A) of the inner member (32A) overlap with a portion of the respective first and second orifices (24A, 26A) of the housing (22A). In preferred embodiments wherein air is only permitted to enter the air inlet (38A) when the control means (50A) is in an open position, external air flows through the air inlet (38A) and into the internal space of the tubular inner member (32A). In one preferred embodiment as shown in Figure 7, air enters through the air inlet (38A) via recess (33A) formed in the gap between the shoulder portion (23A) of the housing (22A) and the wall of the inner member (32A) or the cylindrical portion of the control means (52A). Air then flows through a through-hole (46A) created by the overlap of the second orifice of the inner member (32A) and the second orifice of the housing (22A), through second neck portion (12B) and along the conduit or passage defined by the duct (17A). Once air has entered the duct (17A), air can communicate with the reservoir (10A) via lower and upper joining portions (16Aa, 16Ab). In a preferred embodiment, air can only communicate with the reservoir (10A) via lower joining portion (16Aa). The air flow path from the external atmosphere, to the reservoir (10A) is thus shown in Figure 6 by arrow A. When a pouring operation is commenced, fluid from the reservoir (10A), flows along first neck portion (12A), through a through-hole (44A) created by the overlap of the first orifice (34A) of the inner member (32A) and the first orifice (24A) of the housing (22A), along fluid discharge portion (40Aa) and out of nozzle dispensing means (14A). The fluid flow path from the reservoir (10A) via first neck portion (12A) is shown by arrow B. As fluid is discharged from the container (100A) along pathway B, external air enters the container through the air inlet (38A) and travels along pathway A, to equalize the pressure difference created by the discharge of the fluid.

[0065] In all embodiments, the container (100, 100A, 100B) of the present invention provides two independent pathways, one pathway for fluid to be discharged from the container and a second pathway exclusively for air to flow into the container. As fluid is discharged from the container (100, 100A, 100B) along a first pathway, external air enters

the container through the air inlet (38, 38A) and travels along a second pathway to equalize the pressure difference created by the discharge of the fluid. This ensures that the fluid can be poured in a smooth, even fashion and avoids the alternating or sporadic "glugging" action experienced with containers of the prior art. In addition, the inner member (30, 32A, 32B) and the housing (22, 22A, 22B) are arranged so that they are inclined and slope downwardly towards the control means (50, 50A. 50B) to allow fluid to flow naturally back along the fluid discharge portion (40a, 40Aa, 40Ba) and through the first orifice (24, 24A, 24B) to re-enter the reservoir (10, 10A, 10B) once the pouring operation is completed. This ensures that fluid does not collect in the nozzle area (14, 14A, 14B) and thus reduces the risk of leakage. Typically, the angle of inclination may be from 5 to 15 degrees.

[0066] The container (100, 100A, 100B) of the present invention also provides an effective means of controlling the flow of fluid discharged from the nozzle (14, 14A, 14B) by allowing the extent of overlap of the respective first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B) to be adjusted. When the tap (51, 51A, 51B) of the control means (50, 50A, 50B) is rotated so that there is only a small degree of overlap between the first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B), the cross-sectional area of the respective through-holes is also small. Consequently, the flow rate of fluid dispensed from the container (100, 100A, 100B) is comparatively lower than when the degree of overlap between the first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B) is large. A maximum flow rate of fluid can thus be achieved when the first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B) are in registry with each other (i.e. completely overlapping). The flow control assembly (20, 20A, 20B) of the invention therefore allows a multitude of different flow rates to be pre-set by adjusting the position of the control means (50, 50A, 50B) before commencing the pouring operation. Furthermore, the control means (50, 50A, 50B) can be adjusted incrementally during the pouring operation at the user's convenience to either increase or decrease the flow rate. The container of the present invention thus enables active control of the fluid flow. Alternatively, the user may optionally rotate the tap (51, 51A, 51B) of the control means (50, 50A, 50B) such that the first orifice of the housing (24, 24A, 24B) is in partial overlap with the first orifice of the inner member (34, 34A, 34B) but no overlap exists between the second orifice of the housing (26, 26A, 26B) and the second orifice of the inner member (36, 36A, 36B). In this configuration the container will operate as a conventional fluid dispenser.

[0067] The inclusions of supplementary safety features on the container (100, 100A, 100B) ensure the user cannot inadvertently adjust the control means (50, 50A, 50B) to allow a flow rate which is too high. This is achieved by incorporating a pip or abutment surface on the control means (50, 50A, 50B) which abuts a corresponding pip formed on the internal wall of the inner member (30, 32A, 30B) or the housing (22, 22A, 22B) once the tap or turning means (51, 51A, 51B) has been rotated beyond a certain point. The user may then only continue to turn the tap or turning means (51, 51A, 51B) by applying additional torque or force to overcome the resistance and permit further movement (to allow movement to a position where the orifices on the inner member (30, 32A, 30B) and housing (22, 22A, 22B) are fully overlapped for example).

[0068] Throughout the description and claims of this specification, the words "comprise" and "contain" and variations of them mean "including but not limited to", and they are not intended to (and do not) exclude other moieties, additives, components, integers or steps. Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity, unless the context requires otherwise.

[0069] Features, integers, characteristics, compounds, chemical moieties or groups described in conjunction with a particular aspect, embodiment or example of the invention are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith. All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive. The invention is not restricted to the details of any foregoing embodiments. The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

[0070] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

CLAIMS

1. A container comprising:

a fluid reservoir;

a first flow path for dispensing fluid;

a second flow path for permitting the entry of air into the container so that air can communicate with the fluid in the container;

wherein the first flow path and the second flow path are spatially separate; and

a flow control assembly comprising a control means;

wherein the control means is moveable between a first position in which the first flow path and the second flow path are closed and a second position in which the first flow path and the second flow path are open.

2. A container as claimed in claim 1, wherein said flow control assembly comprises an air entry portion and a fluid dispensing portion.

3. A container as claimed in any preceding claim, wherein fluid in said first flow path cannot communicate with air in said second flow path.

4. A container as claimed in any preceding claim, further comprising a body and one or more neck portions wherein the one or more neck portions connect the flow control assembly to the body.

5. A container as claimed in claim 4, wherein said flow control assembly is coupled to said one or more neck portions.

6. A container as claimed in claim 4 or 5, wherein the one or more neck portions comprise a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path.

7. A container as claimed in claims 4, 5 or 6 when dependent on claim 2, wherein the flow control assembly is configured to define a fluid flow portion from a first neck portion to the fluid dispensing portion and an air flow portion from the air entry portion to a second neck portion when the control means is moved to a second position.

8. A container as claimed in claim 4, wherein the container body is shaped so as to define a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path.

9. A container as claimed in any preceding claim, wherein said flow control assembly comprises a housing.

10. A container as claimed in claim 9, wherein the flow control assembly further comprises an inner member mounted in the housing.

11. A container as claimed in claim 10, wherein the inner member is moveable in the housing.

12. A container as claimed in claims 10 or 11, wherein the inner member is rotatably mounted in the housing.

13. A container as claimed in any of claims 10 to 12, wherein the inner member comprises an orifice adapted to align with an orifice in said housing when said control means is moved to a second position.

14. A container as claimed in any of claims 9 to 13, wherein said housing comprises a first orifice and a second orifice and wherein fluid from the first flow path is dispensed via said first orifice and air from the second flow path flows through the housing via said second orifice.

15. A container as claimed in claim 14, when depending through claim 10 wherein the inner member comprises a first orifice and a second orifice and wherein said first orifice and said second orifice of the inner member are adapted to align with said first orifice and said second orifice of the housing when the control means is moved to a second position.

16. A container as claimed in claims 14 or 15, wherein the first orifice of the housing has a cross-sectional area greater than the second orifice.

17. A container as claimed in any of claims 14 to 16, wherein the first orifice and/or the second orifice of the housing are circular or elliptical.

18. A container as claimed in claims 16 or 17, when depending through claim 15, wherein the first orifice of the inner member has a cross-sectional area greater than the second orifice of inner member.

19. A container as claimed in claim 15 or claims 16 to 18 when depending through claim 15, wherein the first orifice and/or the second orifice of the inner member are circular or elliptical.

20. A container as claimed in any of claims 10 to 19, wherein the control means are in communication with the inner member.

21. A container as claimed in any preceding claim, wherein the control means can be moved to a plurality of different positions.

22. A container as claimed in any preceding claim, wherein the control means comprises a tap.

23. A container as claimed in any preceding claim, wherein the container comprises a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path when the control means is moved to a second position.

24. A container as claimed in claim 8 or claim 23, wherein the duct terminates proximate the reservoir.

25. A container as claimed in any preceding claim, comprising a neck portion extending between the flow control assembly and the fluid reservoir, said neck portion comprising a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path.

26. A container as claimed in any of claims 10 to 25, wherein said inner member comprises an air entry portion and a fluid dispensing portion separated by a fixed member.

27. A container as claimed in claim 26, wherein said air entry portion and fluid dispensing portion are formed in the inner member.

28. A container as claimed in any of claims 2 to 27, wherein the fluid dispensing portion comprises a fluid outlet and the air entry portion comprises an air inlet wherein the cross-sectional area of the fluid outlet is greater than the cross-sectional area of the air inlet.

29. A container as claimed in any of claims 1 to 28, wherein the container comprises at least two spaced apart neck portions, including a first neck portion for dispensing of fluid via the first flow path and a second neck portion comprising a duct for the passage of air via the second flow path when the control means is moved to a second position.

30. A container as claimed in claim 29, when depending through claim 2, wherein the fluid dispensing portion and the air entry portion are located at distant ends of the flow control assembly.

31. A container as claimed in any preceding claim, wherein the flow control assembly comprises means to restrict the range of movement of the control means.

32. A container as claimed in any of claims 10 to 31, wherein the inner member is inclined at an angle of from 5 to 15 degrees.

33. A container as claimed in any preceding claim, wherein the container comprises at least one gripping means.

34. A container as claimed in claim 33, when depending through claim 23, wherein a portion of said gripping means is hollow and defines a portion of said duct.

35. A container as claimed in claim 33 wherein said at least one gripping means is juxtaposed to said flow control assembly.

36. A container as claimed in any preceding claim, wherein the fluid is oil.

37. A container as claimed in any preceding claim, wherein said container comprises a plastics material.

38. A container as claimed in claim 37, wherein said plastics material is high density polyethylene.

39. A container as claimed in any of claims 4 to 38, wherein the body of the container is unitary.

40. A container as claimed in any preceding claim, wherein the capacity of the container is from 3 to 7 litres.

41. A container as claimed in any preceding claim, wherein the capacity of the container is from 4 to 6 litres.

42. A container as hereinbefore described with reference to the accompanying description and the drawings.

43. A method of dispensing a fluid comprising the steps of:
providing a container as claimed in any of claims 1 to 42;
moving the control means to a second position; and
tilting the container to dispense the fluid.

44. A method according to claim 43, further comprising the step of: moving the control means during the dispensing operation to adjust the rate of flow.

45. A method of dispensing a fluid as hereinbefore described with reference to the accompanying description and the drawings.

FLUID DISPENSER

INTRODUCTION

[0001] This invention relates to containers for dispensing fluids, most specifically containers which are used for dispensing oil. Most particularly, the invention relates to containers which may be used to dispense oil into the engines of vehicles, especially motor vehicles.

BACKGROUND

[0002] Oil, such as that used in motor vehicles, is often supplied in large, bulky containers. A common preference for the motor industry is that oil is supplied in containers of capacity between 4 and 5 litres, corresponding to the capacity of a typical oil sump for a motor vehicle. When oil is added to the engine of a motor vehicle, the liquid is often dispensed from the container through an aperture located on the engine. However, the mass of such a container, combined with the oil stored within it, means that handling the container can be awkward leading to difficulties when performing the pouring operation and frequently results in spillage. This problem is further exacerbated by the fact that in modern motor vehicles the engine is housed lower in the chassis, thus making it more difficult to access and increasing the likelihood of spillage during the pouring operation.

[0003] In addition, conventional oil containers suffer from further drawbacks. As liquid is discharged from a container, external air enters the container through the liquid dispenser to equalize the pressure difference created by discharge of the liquid. However when large amounts of liquid are poured, the air intake into the container is insufficient or becomes blocked altogether. As a consequence, a pressure difference is generated between the interior and exterior of the container. Due to this pressure difference, when liquid is poured the liquid flows sporadically in an alternating or "glugging" action. Effectively maintaining an appropriate position of incline when handling a conventional 5 litre oil container to overcome this phenomenon, especially when the container is near full capacity, is particularly difficult. If the degree of inclination of the container is too shallow the flow rate of liquid exiting the dispenser will be too low and oil will simply flow down the external container wall. If the degree of inclination is too steep, then the flow rate may be too high and liquid exiting the container may "overshoot" the aperture located on the engine in which the oil is intended to be poured. Given the complex external profile and number of ancillary aspects modern engines exhibit, spillage of oil in the engine compartment may be especially difficult to clean up and may lead to various damaging effects. In addition, an unpleasant smell and smoke resulting from burning oil can arise as the engine heats up.

[0004] Due to the fact that oil is an increasingly rare and valuable commodity and

considering the above-mentioned problems with conventional oil containers, numerous efforts have been made to provide improved oil storage and dispensing means. Simple solutions involve the use of a funnel inserted into the engine aperture prior to pouring. However, use of a funnel may result in contamination from any material or liquid residing on the funnel surface. As such, a cleaning operation is required before pouring can commence.

[0005] Alternatively, other proposed solutions involve the modification of the liquid dispensing means or nozzle to incorporate an air intake portion which may be separated from the liquid discharge portion (see for example WO 94/07756 and GB 2438391). Although such containers overcome the "glugging" phenomena to an extent, containers of this nature fail to provide additional means to control the rate of flow and the accuracy with which liquid is dispensed from the container. DE 20 2007 002 054 U1 discloses a portable container for liquids and an outlet valve suitable for such a container. The outlet valve is preferably detachably fitted to the container and includes a flexible pipe with a free end that lies above the liquid level.

[0006] An improved container for dispensing fluids is therefore needed which overcomes these problems. Specifically a container for a fluid dispenser is needed that can overcome the problem of "glugging" during the pouring operation and provide an improved means to control the rate of flow of fluid as it exits the container.

BRIEF SUMMARY OF THE DISCLOSURE

[0007] According to a first aspect of the present invention there is provided a container comprising:

a fluid reservoir;

a first flow path for dispensing fluid;

a second flow path for permitting the entry of air into the container so that air can communicate with the fluid in the container;

wherein the first flow path and the second flow path are spatially separate; and

a flow control assembly comprising a control means;

wherein the control means is moveable between a first position in which the first flow path and the second flow path are closed and a second position in which the first flow path and the second flow path are open.

[0008] The present invention provides two pathways, one pathway for fluid to be discharged from the container and another independent pathway for air to flow into the container. The provision of the two independent pathways ensures the problem of

"glugging" during the pouring operation can be avoided. Furthermore, the inclusion of a flow control assembly provides the container with means operable to accurately control the rate of liquid dispensed during the pouring operation supplemental to that which can be achieved by simply altering the angle of inclination of the container.

[0009] In typical embodiments of the invention, said flow control assembly comprises an air entry portion and a fluid dispensing portion.

[0010] In one preferred embodiment, fluid in said first flow path cannot communicate with air in said second flow path.

[0011] In an embodiment, the container further comprises a body and one or more neck portions wherein the one or more neck portions connect the flow control assembly to the body. In an embodiment, the flow control assembly is coupled to said one or more neck portions. In an embodiment, the one or more neck portions comprise a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path. In some preferred embodiments, the flow control assembly is configured to define a fluid flow portion from a first neck portion to the fluid dispensing portion for dispensing fluid via the first flow path and an air flow portion from the air entry portion to a second neck portion for the passage of air via the second flow path when the control means is moved to a second position. The inclusion of one or more neck portions comprising fluid flow and air flow portions advantageously ensures that the respective air and liquid flow paths maintain their independence.

[0012] In an embodiment, the container body is shaped so as to define a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path. Shaping of the container body to define a duct obviates the requirement for supplementary features (such as flexible tubing for example) to allow external air to communicate with liquid in the reservoir whilst maintaining separation between the air and fluid flow paths.

[0013] In further preferred embodiments, said flow control assembly comprises a housing. Preferably, the flow control assembly further comprises an inner member mounted in the housing. Preferably, the inner member is moveable in the housing. In further preferred embodiments, the inner member is rotatably mounted in the housing. Preferably, said inner member comprises an orifice adapted to align with an orifice in said housing when said control means is moved to a second position. In such embodiments, ingress of air into the reservoir of the container is facilitated when said orifices are aligned.

[0014] In still further preferred embodiments, said housing comprises a first orifice and a second orifice and wherein fluid from the first flow path is dispensed via said first orifice

and air from the second flow path flows through the housing via said second orifice. In preferred embodiments, the inner member comprises a first orifice and a second orifice and wherein said first orifice and said second orifice of the inner member are adapted to align with said first orifice and said second orifice of the housing when the control means is moved to a second position.

[0015] In further preferred embodiments, the first orifice of the housing has a cross-sectional area greater than the second orifice. Preferably, the first orifice and/or the second orifice of the housing are circular or elliptical. In other embodiments the first orifice and/or the second orifice of the housing are diamond shaped. In preferred embodiments of the invention wherein said flow control assembly comprises a housing and an inner member, the first orifice of the inner member has a cross-sectional area greater than the second orifice of inner member. Preferably, the first orifice and/or the second orifice of the inner member are circular or elliptical. In other embodiments the first orifice and/or the second orifice of the inner member are diamond shaped.

[0016] The container of the present invention comprises control means. In some embodiments the control means are in communication with the inner member. Preferably, the control means are connected to the inner member. In other embodiments, the control means are integral with the inner member.

[0017] Typically the control means of the present invention can be moved to a plurality of different positions. Advantageously, in such embodiments a user can "pre-select" a desired flow rate by moving the control means before commencing the pouring operation. When the pouring operation has been commenced, the control means can be moved further when in the second or "open" position to adjust the rate of fluid flow thereby controlling the rate in which the fluid is dispensed. Preferably, the control means comprises a tap.

[0018] In preferred embodiments, the container of the present invention comprises a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path when the control means is moved to a second position. Preferably the duct terminates proximate the reservoir. The duct may be spatially separate from the reservoir. Advantageously, in such embodiments the duct does not extend into the space defined by the reservoir or the chamber of the reservoir. This ensures the capacity of fluid that can be stored in the reservoir is not adversely impacted.

[0019] In some embodiments of the invention wherein fluid in said first flow path cannot communicate with air in said second flow path, the container comprises a neck portion extending between the flow control assembly and the fluid reservoir, said neck portion

comprising a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path.

[0020] In such embodiments wherein fluid in said first flow path cannot communicate with air in said second flow path and said flow control assembly comprises a housing and an inner member, said inner member comprises an air entry portion and a fluid dispensing portion separated by a fixed member. Thus in such embodiments when the control means is moved to a second position, the air entry portion and the fluid dispensing portion of the inner member align respectively with the air flow portion and the fluid flow portion of the neck portion so as to allow for egress of fluid from and ingress of air into the reservoir. Preferably, said air entry portion and said fluid dispensing portion are formed in said inner member. Thus in such embodiments, the inner member is shaped, moulded or otherwise configured to direct the passage of air and fluid through the inner member.

[0021] In particularly preferred embodiments of the invention, the fluid dispensing portion comprises a fluid outlet and the air entry portion comprises an air inlet wherein the cross-sectional area of the fluid outlet is greater than the cross-sectional area of the air inlet.

[0022] In some alternative embodiments of the invention, fluid in said first flow path is able to communicate with air in said second flow path. In such embodiments, said flow control assembly typically comprises an air entry portion and a fluid dispensing portion which are spaced apart but does not prevent communication between air and fluid from the respective flow paths. Typically (but not exclusively), in such embodiments, said flow control assembly is connected to the reservoir by means of multiple neck portions, most conveniently, two spaced apart neck portions, wherein a first neck portion comprises an air entry portion and a second neck portion comprises a fluid dispensing portion. In said embodiments, the container comprises at least two spaced apart neck portions, including a first neck portion for dispensing of fluid via the first flow path and a second neck portion comprising a duct for the passage of air via the second flow path when the control means is moved to a second position. Thus, in said embodiments, the fluid dispensing portion comprising the fluid outlet and the air entry portion comprising the air inlet are typically distant from each other and may be located at distant ends of said flow control assembly. Advantageously, the positioning of the fluid dispensing portion and the air entry portion in such embodiments ensures the fluid and air flow paths are spaced apart to such an extent that, although communication between air and fluid from the respective flow paths is not prevented, there is no significant interaction between fluid from the first flow path and air from the second flow path. Most conveniently, said fluid outlet is comprised in a nozzle at one end of said flow control assembly, whilst said air inlet is located at a distant end of the assembly.

[0023] In embodiments of the invention comprising a first neck portion for dispensing of fluid via the first flow path and a second neck portion comprising a duct for the passage of air via the second flow path when the control means is moved to a second position and wherein said flow control assembly comprises a housing and an inner member mounted in said housing, said neck portions may be comprised in said housing and said inner member may comprise separate spaced apart orifices adapted to align with said neck portions such that egress of fluid from and ingress of air into said reservoir is facilitated.

[0024] In further preferred embodiments of the invention, the flow control assembly comprises means to restrict the range of movement of the control means. Optionally, the control means comprises an abutment surface formed therein.

[0025] In embodiments wherein the flow control assembly comprises an inner member, preferably the inner member is inclined at an angle of from 5 to 15 degrees.

[0026] The container of the present invention preferably comprises at least one handle or gripping means. Preferably said handle or gripping means is hollow and defines a portion of said duct. As the handle or gripping means may define a portion of the duct, the construction of the container is simplified. Thus the duct can be integrated within the normal design constraints of a typical fluid dispenser without the dispenser requiring further structural modifications. In further embodiments, said at least one gripping means is juxtaposed to said flow control assembly.

[0027] The container of the present invention is particularly suitable for the dispensing of fluids. Preferably, the fluid is oil. The invention is not however to be limited in this regard and the container of the present invention could be used for dispensing other fluids such as, for example, antifreeze, de-icer, screenwash, fuel treatment fluids and fuel additives.

[0028] Preferably, the container of the present invention comprises a container which is formed from a plastics material. Any plastics material having the required degree of resilience, dimensional stability and resistance to attack by the liquids which are to be placed in the container is suitable for this purpose. Preferably, the plastics material comprises commercially available high density polyethylene (HDPE). In some embodiments, the body of the container is unitary.

[0029] Preferably the capacity of the container is from 3 to 7 litres. Particularly, the capacity of the container is from 4 to 6 litres. Most preferably, the capacity of the container is 5 litres.

[0030] According to a second aspect of the present invention, there is provided a method of dispensing a fluid comprising the steps of:

providing a container according to the first aspect of the invention;

moving the control means to a second position; and

tilting the container to dispense the fluid.

[0031] In a preferred embodiment, there is provided a method of dispensing a fluid according to the second aspect of the invention further comprising the step of:

moving the control means during the dispensing operation to adjust the rate of flow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] Embodiments of the invention are further described hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a front elevation of the container according to a first embodiment of the present invention;

Figure 2 is a perspective view of a neck of the container according to a first embodiment of the invention;

Figure 3 is a cross-sectional view of the flow control assembly according to a first embodiment of the present invention;

Figure 4 is a cross-sectional view of the inner member of the flow control assembly according a first embodiment of to the present invention;

Figure 5 is a front view of the flow control assembly according to a first embodiment of the present invention;

Figure 6 is a front elevation of the container according to a second embodiment of the present invention;

Figure 7 is a cross-sectional view of the flow control assembly according to a second embodiment of the present invention;

Figure 8 is a cross-sectional view of the inner member of the flow control assembly according to a second embodiment of the present invention.

Figure 9 is a front elevation of the container according to a third embodiment of the present invention;

Figure 10 is A) a plan view and B) a side view of a neck of the container according to a third embodiment of the invention;

Figure 11 is a cross-sectional view of the flow control assembly according to a third embodiment of the present invention;

Figure 12 is an exploded view of the flow control assembly according to a third embodiment of the present invention;

Figure 13 is a cross-sectional view of the flow control assembly according to a third embodiment of the present invention in A) a closed position and B) an open position.

DETAILED DESCRIPTION

[0033] Referring to Figure 1, there is a container (100) for dispensing fluids which comprises a reservoir (10) and a neck (11) for fluid to flow between the reservoir (10) and a dispensing nozzle (14) when the container is suitably tilted. The body (90) of container (100) comprises the reservoir (10). Situated on top of the container (100) is a flow control assembly (20) which is connected to the body (90) and reservoir (10) via neck (11). Alternatively, or in addition, the flow control assembly (20) may be connected to the body (90) and reservoir (10) by any suitable attachment means. Container (100) is provided with a gripping portion such as a handle (16) to assist with the fluid dispensing operation. Handle (16) comprises a hollow interior and defines a portion of a duct (18) which extends from the flow control assembly (20) and through neck (11). Duct (18) may be separated from the reservoir (10) by a pinched section or dividing wall (19). Fluid dispensing nozzle (14) may include a threaded portion onto which a cap (15) can be screwed when the container (100) is not required for any dispensing operation. The fluid dispensing nozzle (14) and cap (15) may have additional safety features to ensure the cap (15) cannot easily be removed by children (such a cap and nozzle arrangement will be familiar to those of skill in the art). Container (100) may comprise other features to improve its aesthetic appearance. For example, container (100) may also comprise a member (21) disposed between the flow control assembly (20) and the reservoir (10). In an embodiment, the member (21) resides between a top portion of the body of container (100) above reservoir (10) and a portion of the flow control assembly (20) distal to the nozzle (14). As the member (21) is an aesthetic feature of the container (100) it performs no functional purpose.

[0034] Referring to Figure 2 and Figure 3, the flow control assembly (20) is connected to the body (90) and reservoir (10) by a neck portion (11). Neck portion (11) is divided into a fluid flow portion (12) comprising a first channel (12a) for flow of fluid and an air flow portion (13) comprising a second channel (13a) for passage of air. Fluid flow portion (12) and air flow portion (13) are linked by a fixed member (11a). Neck (11) enables connection of the flow control assembly (20) to the body (90) and reservoir (10) by

engagement of respective threaded portions on the fluid flow portion and air flow portion (11b, 11c) with a corresponding threaded portion (29a) on the interior of a collar (29) disposed between the body (90) and reservoir (10) and the flow control assembly (20).

[0035] With reference to Figure 3, the flow control assembly (20) comprises a housing (22), inner member (30), control means (50), nozzle (14), air inlet (38) and a fluid outlet (40). Nozzle (14) may be integrally formed as part of the housing (22) or connected to the housing (22). The housing (22) may comprise a generally cylindrical tube having a first end proximate the nozzle (14) and a second end proximate the control means (50). The housing (22) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, housing (22) is constructed from a plastic material such as high-density polyethylene. Typically, the length of the housing (22) is from 100 mm to 120 mm with a diameter of from 30 mm to 40 mm. The housing (22) further comprises a first orifice (24) and a second orifice (26) formed in housing wall (22a). It is preferred that the first and second orifices (24, 26) are formed in a portion of the wall (22a) nearest the reservoir (10). The first orifice (24) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (24) may be diamond shaped. The second orifice (26) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (26) may be diamond shaped. However, the skilled person will appreciate that the first orifice (24) and the second orifice (26) may adopt a variety of shapes and that the invention is not to be limited in this regard. The cross-sectional area of the first orifice (24) is sufficiently sized so that, in use, when the container (100) is suitably tilted fluid can be transferred effectively from the reservoir (10), through the first orifice (24) and out through the nozzle (14). The cross-sectional area of the first orifice (24) is preferably larger than the cross-sectional area of the second orifice (26). Typically, the cross-sectional area of the first orifice (24) will be at least twice that of the second orifice (26). In one embodiment the cross-sectional area of the first orifice (24) is three times that of the second orifice (26). In another embodiment, the cross-sectional area of the first orifice (24) is four times that of the second orifice (26). Flow control assembly (20) further comprises a fluid flow portion (27) and an air flow portion (28). Fluid flow portion (27) and air flow portion (28) extend from housing (22) and are respectively coincident with the first orifice (24) and the second orifice (26). Conveniently, fluid flow portion and air flow portion (27, 28) may be formed out of the same material as the housing (22). Fluid flow portion (27) is defined by wall (27a) and air flow portion (28) by wall (28a). Fluid flow portion (27) and air flow portion (28) are separated in space by wall portion (22b) of the housing (22). Typically, fluid flow portion and air flow portion (27,28) of the flow control assembly (20) are aligned with the fluid flow portion and air flow portion (12,13) of the neck portion (11) of container (100).

[0036] In embodiments wherein the housing (22) comprises a generally cylindrical tube, the cross-sectional area of the housing (22) may be constant throughout the length of the tube. In other embodiments, the housing (22) may have a cross-sectional area greater at one end. In one embodiment, the second end of the housing (22) proximate the flow control means (50) has a cross-sectional area greater than the first end of the housing (22) proximate the fluid dispensing means (14). In one embodiment the housing (22) may be outwardly tapered in the direction of the control means (50).

[0037] Referring to Figures 3 and 4, the inner member (30) is adapted to be mounted in the housing (22). Accordingly, the outer profile of the inner member (30) is shaped so as to generally conform to the inner profile of the housing (22). Thus when the housing (22) is generally cylindrical, the outer profile of inner member (30) will also be generally cylindrical. Thus in one embodiment, the inner member (30) may comprise a generally cylindrical member with a tubular portion. Conveniently, inner member (30) may have a diameter which is slightly less than the housing (22) so that inner member (30) can be mounted in the housing (22) by a tight friction fit. However, the nature of the fit is such that the inner member (30) is moveable in the housing (22). In a preferred embodiment, inner member (30) is rotatably moveable in the housing (22). Typically, the length of the inner member (30) is from 100 mm to 120 mm with a diameter of 30 mm to 40 mm. Suitably, in embodiments wherein the inner member (30) is adapted to be mounted in housing (22), the length and diameter of the inner member (30) are less than the length and diameter of the housing (22).

[0038] The inner member (30) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, inner member (30) is constructed from a plastic material such as high-density polyethylene. The inner member (30) comprises a wall (30a), an air entry portion (38a), a fluid discharge portion (40a), a fixed member (39), a first orifice (34) and a second orifice (36). Suitably, the inner member (30) may be shaped so that fluid discharge portion (40a) and air entry portion (38a) are integrally formed therein. Fluid discharge portion (40a) extends from fluid outlet (40) and air entry portion (38a) extends from air inlet (38). Thus fluid discharge portion (40a) and air entry potion (38a) extend within the body of inner member (30). As shown in Figures 3 and 4, said air entry portion (38a) comprises a channel defined between fixed member (39) and wall (30a). Said channel extends within the inner member (30) leading to a chamber (35) with an internal space greater than the volume of the air entry portion (38a).

[0039] The first orifice (34) of the inner member (30) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (34) may be diamond shaped.

Although the first orifice (34) may be formed in a variety of different shapes, in a much preferred embodiment the first orifice (34) of the inner member complements the shape of the first orifice (24) of the housing (22). The second orifice (36) of the inner member (30) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (36) may be diamond shaped. As with the first orifice, it is preferred that the second orifice (36) of the inner member (30) complements the shape of the second orifice (26) of the housing (22). Typically, the diameters of the first and second orifices (34, 36) of the inner member (30) will be the same as the respective first and second orifices (24, 26) of the housing (22).

[0040] The inner member (30) has a first end proximate the nozzle (14) and a second end proximate the flow control means (50). A fixed member (39) or dividing wall separates fluid discharge portion (40a) and air entry portion (38a). The fixed member (39) extends upwardly from a portion of the wall (30b) of the inner member (30) located between the first orifice (34) and the second orifice (36) and terminates at the first end proximate the nozzle (14). The fixed member (39) may be curved in the region immediately above the first orifice (34). Advantageously, the curvature of the fixed member (39) in this region facilitates the smooth movement of fluid towards the fluid outlet (40) after exiting the first orifice (34) when the container (100) is tilted steeply. As depicted in Figure 5, the cross-sectional area of the fluid outlet (40) is preferably greater than the cross-sectional area of the air inlet (38). Typically, the cross-sectional area of fluid outlet (40) is at least twice that of the air inlet (38). In one embodiment, the cross-sectional area of the fluid outlet (40) is three times the cross-sectional area of the air inlet (38). In another embodiment, the cross-sectional area of the fluid outlet (40) is four times the cross-sectional area of the air inlet (38). Furthermore, the internal space comprised in the fluid discharge portion (40a) is preferably greater than that of the air entry portion (38a). As such, the greater internal space of the fluid discharge portion (40a) achieved by the shaping of the inner member (30) ensures that the volume of fluid that can be discharged is minimally impacted by the division of the nozzle region (14) of the container into a separate fluid discharge portion (40a) and air entry portion (38a).

[0041] The control means (50) of the flow control assembly (20) is preferably located at an end distal to the nozzle (14). The control means may include engagement means such as an arm, a lever or turning means. In a preferred case, the control means (50) conveniently comprises a tap (51). The tap (51) may comprise equidistantly displaced ridges (51a) to aid gripping and rotation. Control means (50) may be formed integrally with the inner member (30) or may be a separate component which communicates with the inner member (30). In the arrangement whereby the control means (50) communicates

with the inner member (30), control means (50) may be connected or attached to the inner member (30) by any suitable means. In some embodiments, projections or ribs formed on the interior of the control means (50) may engage corresponding crevices or slots in the exterior of the inner member (30) to enable rotation thereof. In other embodiments, the inner member (30) comprises projections or fins which may engage corresponding slots formed in the control means (50) to enable rotation thereof. In further embodiments, the control means (50) may be slidably engageable with the inner member (30). Thus the control means (50) may be moveable by sliding between a forward and backward position. When the control means (50) is in the forward position and engaged with the inner member (30), the control means (50) may be rotatably moveable to effect a rotational movement of both the control means (50) and the inner member (30). Alternatively, the control means (50) may be adapted so that a portion fits within the inner member (30). In this embodiment, the control means (50) may comprise a cylindrical portion (52) with a diameter less than that of inner member (30) so that the cylindrical portion (52) can fit inside the tube of inner member (30). Alternatively, or in addition, the inner member (30) may be adapted for the insertion of the control means (50). For example, the inner member (30) may be outwardly tapered or a linear section of the tube of the inner member (30) may have a larger cross-sectional area to accommodate the control means (50). In all embodiments, the control means (50) is moveable with respect to the housing (22) and in preferred embodiments, the control means is rotatably moveable with respect to the housing (22).

[0042] The control means (50) is moveable by engagement of a lever, arm or a turning means. In the preferred case wherein the control means (50) comprises a tap (51), it is moveable by rotation thereof. In embodiments wherein the control means (50) communicates with the inner member (30), movement of the control means (50) causes a consequent movement of the inner member (30). A portion of the control means (50) may be adapted to be mounted in the housing (22) using the same means by which the inner member (30) is mounted in the housing (22). For example, the housing (22) may be outwardly tapered or a linear section of the tube of the housing (22) may have a larger cross-sectional area to accommodate the control means (50). The control means (50) is moveable through a range of different positions including at least one closed position and at least one open position. Suitable markings or indicia may be provided on an appropriate part of the control means (50), flow control assembly (20) and/or container (100) to indicate the respective open and closed positions (or any intermediate positions). When the control means (50) includes a turning means or tap (51), it may be rotated through 360°. As such, the flow control assembly (20) can adopt a number of different "open" positions which can be used to control the flow rate of fluid when it is dispensed from the

container (100). Control means (50) may further comprise additional features to limit the maximum flow rate. For example, control means (50) may comprise a projection or abutment surface formed therein which, once moved beyond a certain position, abuts a corresponding projection or abutment surface to prevent any further movement of the control means (50). The control means (50) may therefore include a pip that abuts a corresponding pip formed on the internal wall of the inner member (30) or the housing (22) to prevent further rotation. In another embodiment, the pip or abutment surface may be dimensioned so that further movement or rotation of the control means (50) is merely restricted and not prevented entirely. If therefore the user applies additional torque or force to the tap or turning means then the resistance may be overcome and further movement will be permitted. In addition, the container (100) may comprise one or more features to prevent movement of the control means (50) when fluid is not to be dispensed from the container (100). For example, the control means (50) may be moveable between a forward position and a backward position. In such embodiments, the first and second flow paths may only be opened by an additional movement of the control means (for example, by rotation thereof) when the control means (50) has been placed in a forward position. Thus, when the control means is in a backward position rotation of the control means is prevented and the first and second flow paths cannot be opened. The control means may be slidably moveable between forward and backward positions.

[0043] In some alternative embodiments, the container of the present invention may comprise more than one neck connecting the flow control assembly to the reservoir. With reference to Figure 6, container (100A) comprises a first neck portion (12A) and a second neck portion (12B). Flow control assembly (20A) is connected to the reservoir (10A) via first and second spaced apart neck portions (12A, 12B). Alternatively, or in addition, the flow control assembly (20A) may be connected to the reservoir (10A) by any suitable attachment means. Container (100A) is provided with a gripping portion such as a handle (18A), optionally situated between the reservoir (10A) and the flow control assembly (20A), to assist with the fluid dispensing operation. Container (100A) also comprises tubular member (16B) extending from second neck portion (12B). Tubular member (16B) may also serve as a gripping portion so that a user may conduct the pouring operation by gripping the container (100A) at its side as well as from above. Tubular member (16B) is connected to reservoir (10A) by lower joining portion (16Aa) and upper joining portion (16Ab). The container (100A) further comprises a fluid dispensing nozzle (14A) which may be formed integrally with the flow control assembly (20A). Alternatively, fluid dispensing nozzle (14A) may be a separate component adapted to be inserted into a portion of the flow control assembly (20A) or may be attached to the flow control assembly (20A) by any suitable means. Fluid dispensing nozzle (14A) may include a threaded portion onto which

a cap (15A) can be screwed when the container (100A) is not required for any pouring operation.

[0044] With reference to Figure 7, the flow control assembly (20A) in such embodiments comprises a housing (22A), inner member (32A), control means (50A), fluid outlet (40A), fluid discharge portion (40Aa), air entry portion (33A) and an air inlet (38A). Fluid outlet (40A) and air inlet (38A) are typically located at distant ends of said flow control assembly (20A). Fluid outlet (40A) is comprised in dispensing nozzle (14A) at a first end of flow control assembly (20A). Housing (22A) has a first end proximate the dispensing nozzle (14A) and a second end proximate the control means (50A). The housing (22A) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, housing (22A) is constructed from a plastic material such as high-density polyethylene. Typically, the length of the housing (22A) is from 100 mm to 120 mm with a diameter of from 30 mm to 40 mm. The housing (22A) may be an elongate generally cylindrical tube. The housing (22A) further comprises a first orifice (24A) and a second orifice (26A) formed in housing wall (22Aa). It is preferred that the first and second orifices (24A, 26A) are formed in a portion of the wall (22Aa) nearest the reservoir (10A). The first orifice (24A) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (24A) may be diamond shaped. The second orifice (26A) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (26A) may be diamond shaped. However, the skilled person will appreciate that the first orifice (24A) and second orifice (26A) may adopt a variety of shapes and that the invention is not to be limited in this regard. The cross-sectional area of the first orifice (24A) is preferably larger than the cross-sectional area of the second orifice (26A).Typically, the cross-sectional area of the first orifice (24A) will be at least twice that of the second orifice (26A). In one embodiment, the cross-sectional area of the first orifice (24A) is three times that of the second orifice (26A). In another embodiment, the cross-sectional area of the first orifice (24A) is four times that of the second orifice (26A).

[0045] In one example of such embodiments, the wall of the housing (22Aa) is linear. Hence, the cross-sectional area of the housing (22A) may be constant throughout the length of the tube. In other embodiments, the housing (22A) may have a cross-sectional area greater at one end. In a preferred case, a second end of the housing (22A) proximate the flow control means (50A) has a cross-sectional area greater than the first end of the housing (22A) proximate the fluid dispensing means (14A). In one embodiment the housing (22A) may be outwardly tapered in the direction of the control means (50A). In a particularly preferred embodiment, the second end of the housing (22A) proximate the control means (50A) comprises a shoulder portion (23A). The shoulder portion (23A) is

formed from a section of the housing wall (22Aa) which, instead of adopting a continuous linear path, curves outwardly before resuming a linear path to create a "bulge" in the region of the second end of the housing proximate the control means (50A). In a preferred aspect of this embodiment, the shoulder portion (23A) is formed in a portion of the housing wall (22Aa) distanced furthest from the reservoir (10A).

[0046] Referring to Figures 7 and 8, the inner member (32A) of flow control assembly (20A) is adapted to be mounted in housing (22A). Conveniently, inner member (32A) may have a diameter which is slightly less than housing (22A) so that inner member (32A) can be mounted in the housing (22A) by a tight friction fit. However, the nature of the fit is such that the inner member (32A) is moveable in the housing (22A). As such, inner member (32A) is shaped so as to generally conform to the inner profile of the housing (22A). Thus when housing (22A) is generally cylindrical, inner member (32A) will also be cylindrical. In a preferred case, inner member (32A) is rotatably moveable in the housing (22A). Typically, the length of the inner member (32A) is from 100 mm to 120 mm with a diameter of 30 mm to 40 mm. Suitably, in embodiments wherein the inner member (32A) is adapted to be mounted in housing (22A), the length and diameter of the inner member (32A) are less than the length and diameter of the housing (22A).

[0047] The inner member (32A) may be constructed from any mouldable material with oil resistant properties such as plastic or metal. In an embodiment, inner member (32A) is constructed from a plastic material such as high-density polyethylene. Inner member (32A) has a first end proximate the dispensing nozzle (14A) and a second end proximate the control means (50A). Preferably inner member (32A) is tubular. The cross-sectional area of inner member (32A) may be constant throughout the length of the tube. Alternatively, the inner member (32A) may have a cross-sectional area that is greater at one end. In one embodiment the end of the inner member (32A) with greater cross-sectional area is outwardly tapered to facilitate insertion of the control means (50A). In another embodiment, a linear section of the tube may have a larger cross-sectional area to accommodate the control means (50A). The inner member (32A) further comprises a first orifice (34A) and a second orifice (36A). The first orifice (34A) of the inner member (32A) may be shaped so as to be generally circular or elliptical. Alternatively the first orifice (34A) may be diamond shaped. Although the first orifice (34A) may be formed in a variety of different shapes, in a much preferred embodiment the first orifice (34A) of the inner member (32A) will compliment the shape of the first orifice (24A) of housing (22A). The second orifice (36A) of the inner member (32A) may also be shaped so as to be generally circular or elliptical. Alternatively, the second orifice (36A) may be diamond shaped. As with the first orifice, it is preferred that the second orifice (36A) of the inner

member (32A) compliments the shape of the second orifice (26A) of housing (22A). Typically, the diameters of the first and second orifices (34A, 36A) of the inner member (32A) will be the same as the respective first and second orifices (24A, 26A) of the housing (22A). Inner member (32A) may further comprise an air inlet (38A) formed in a portion of the wall (32Aa). In a preferred case, the air inlet (38A) is formed in a portion of the wall of the inner member (32A) at the second end proximate the control means (50A). In a further preferred aspect of this embodiment, the air inlet (38A) is formed in a portion of the wall (32Aa) opposed to the second orifice (36A).

[0048] The flow control assembly (20A) further comprises control means (50A) which includes engagement means such as an arm, a lever or turning means. In a preferred embodiment, the control means (50A) conveniently comprises a tap (51A). In such embodiments, control means (50A) and tap (51A) may comprise substantially the same features as in the first embodiment of the invention as hereinbefore described with reference to Figures 1 to 5. Thus, control means (50A) may be formed integrally with the inner member (32A) or may be a separate component which communicates with the inner member (32A). In the arrangement whereby the control means (50A) communicates with the inner member (32A), control means (50A) may be connected or attached to the inner member (32A) by any suitable means. Alternatively, control means (50A) may be adapted so that a portion fits within the inner member (32A). In this embodiment, the control means (50A) may comprise a cylindrical portion (52A) with a diameter less than that of inner member (32A) so that the cylindrical portion (52A) can fit inside the tube of inner member (32A). Alternatively, or in addition, the inner member (32A) may be adapted for the insertion of the control means (50A). For example, the inner member (32A) may be outwardly tapered or a linear section of the tube of the inner member (32A) may have a larger cross-sectional area to accommodate the control means (50A). In all embodiments, the control means (50A) is moveable with respect to the housing (22A) and in preferred embodiments, the control means is rotatably moveable with respect to the housing (22A).

[0049] The flow control assembly (20A) further comprises at least one air inlet (38A) so that external air can communicate with the fluid in the container (100A). In a preferred case, air is only permitted to enter the air inlet (38A) when the control means (50A) is moved to an open position. In a particularly preferred embodiment, the air inlet (38A) is formed in the wall (32Aa) of the inner member (32Aa) or the wall (50Aa) of the cylindrical portion of the control means (50A). In this preferred arrangement, the second end of the housing (22A) proximate the control means (50A) has a greater cross sectional area than the first end of the housing proximate the fluid dispensing means (14A). As such, a portion of the wall of the housing (22A) near the second end is shaped so that the wall of the inner

member (32A) or the wall of the cylindrical portion of the control means (52A) is not in contact with the wall of the housing (22A) in this region. An air entry portion (33A) created by a recess or gap is thus present between the wall of the housing (22A) and the wall of the inner member (32A) or the wall of the cylindrical portion of the control means (52A). The air inlet (38A) formed in the inner member (32A) or the control means (50A) is coincident with the recess or gap of the air entry portion (33A) when the control means (50A) is moved to an open position. In a particular preferred aspect of this embodiment the second end of the housing (22A) proximate the control means (50A) comprising the air entry portion (33A) is formed by shoulder portion (23A).

[0050] In another alternative embodiment wherein air is only permitted to enter the air inlet (38A) when the control means (50A) is moved to an open position, the air inlet (38A) may be formed in the wall of inner member (32Aa) or the wall of the cylindrical portion of the control means (50Aa) and an additional air inlet may be formed in the housing (22A). When the control means (50A) is moved to an open position, the further air inlet in the housing (22A) has at least a portion which overlaps with the air inlet (38A) formed in the inner member (32A) or the control means (50A) such that air can enter and communicate with the internal space of the inner member (32A).

[0051] In other arrangements, an air inlet (not shown in the Figures) may be formed in a portion of the control means (50A) which is not enclosed by the housing (22A) or inner member (32A). In these particular embodiments, air can enter through said air inlet and communicate with the internal space of the inner member (32A) when the control means (50A) is in any position (i.e. closed or open).

[0052] Further embodiments of the container of the invention are shown in Figures 9 to 13. Referring to Figure 9, there is a container (100B) for dispensing fluids which comprises a body (90B), a reservoir (10B) and a neck (11A) for fluid to flow between the reservoir (10B) and a fluid dispensing nozzle (14B). Fluid dispensing nozzle (14B) may include a threaded portion onto which a cap (15B) can be screwed when the container (100B) is not required for any pouring operation. The container (100B) includes a flow control assembly (20B) which is connected to the body (90B) via neck (11A). Container (100B) is provided with one or more gripping means such as handles (16B and 16C) to assist with the fluid dispensing operation. In the embodiment shown in Figure 9, a first gripping means (16C) is located at an upper section of the container adjacent to the flow control assembly (20B) and a second gripping means (16B) is located at a mid-section of the container adjacent to and spaced apart from the reservoir (10B). At least one portion of the one or more gripping means (16B) comprises a hollow interior and defines a portion of a duct (18B) which extends from the flow control assembly (20B), through neck (11A) and terminates at

reservoir (10B). Duct (18B) may be separated from the reservoir (10B) by a pinched section or dividing wall (19B). Duct (18B) comprises a first section that extends through the flow control assembly (20B) and a second section that extends through neck (11A). The container (100B) further comprises a communicating member (12E) linking the neck (11A) and handle 16(B). The communicating member (12E) defines a connecting channel which comprises a middle section (18Ba) of the duct (18B). The connecting channel may be integrally formed as part of body (90B). Thus the body (90B) may be shaped or moulded to include the duct (18B). The hollow portion of gripping means or handle (16B) defines the end section (18Bb) of the duct (18B). Handle 16B is connected to the reservoir (10B) by a joining portion (16Ba). In certain embodiments, the duct (18B) may not extend into the reservoir (10B) and may terminate at a position coincident with the joining portion (16Ba).

[0053] With reference to Figure 9 and Figure 10A) and B), the neck (11A) comprises a first neck portion (12C) and a second neck portion (12D). The first and second neck portions (12C, 12D) are linked and spaced apart by a fixed member (11Ba) and protrude upwardly from container body (90B). The first neck portion (12C) comprises a fluid flow portion (12Ca) defining a first channel for flow of fluid. The second neck portion (12D) comprises an air flow portion (12Da) defining a second channel for passage of air.

[0054] Referring now to Figure 11, the flow control assembly (20B) in accordance with the third embodiment of the invention is depicted. In many respects, the flow control assembly (20B) of the third embodiment of the invention is similar to the flow control assembly of the first embodiment of the invention as hereinbefore described with reference to Figures 1 to 5. The flow control assembly (20B) thus comprises a housing (22B), inner member (30B), flow control means (50B), nozzle (14B), air inlet (38) and a fluid outlet (40). The features of the nozzle (14B) and the housing (22B) equate to those described in relation to the first embodiment of the invention. The housing (22B) further comprises a first orifice (24B) and a second orifice (26B) formed in housing wall (22Ba) with features similar to those described with respect to the first embodiment of the invention. Flow control assembly (20B) further comprises a fluid flow portion (27B) and an air flow portion (28B). Fluid flow portion (27B) and air flow portion (28B) extend from housing (22B) and are respectively coincident with the first orifice (24B) and the second orifice (26B). Conveniently, fluid flow portion and air flow portion (27B, 28B) may be formed out of the same material as the housing (22B). Fluid flow portion (27B) is defined by wall (27Ba) and air flow portion (28B) by wall (28Ba). Fluid flow portion (27B) and air flow portion (28B) are separated in space by wall portion (22Bb) of the housing (22B). Typically, fluid flow portion and air flow portion (27B, 28B) of the flow control assembly

(20B) are aligned with the first neck portion (12C) and second neck portion (12D) of the container (100B).

[0055] The housing (22B), and therefore the flow control assembly (20B), may be attached to neck (11A) and the body (90B) of the container (100B) by coupling means. For example, housing (22B) may contain coupling members (27C and 28C) to enable attachment to the first and second neck portions (12C, 12D). As shown in Figure 12, washers (13A and 13B) may be included between the coupling members and the first and second neck portions. The coupling means allow the housing (22B), and thus the flow control assembly (20B), to be clipped or "snap fitted" to the body (90B) of the container.

[0056] With reference to Figures 11 and 12, the third embodiment of the invention may comprise a flow control assembly (20B) containing an inner member (30B) with the same features as those described with respect to the first embodiment of the invention. Thus the inner member (30B) has a first end proximate the nozzle (14) and a second end proximate the flow control means (50B). The inner member (30B) comprises a fluid discharge portion (40Ba) and an air entry portion (38Ba). The inner member (30B) also comprises a first orifice (34B) and a second orifice (36B). The inner member (30B) may further comprise a chamber (35B). The fluid discharge portion (40Ba) is separated from air entry portion (38Ba) by a fixed member or dividing wall (39B). The fixed member (39B) extends upwardly from a portion of the wall (30Bb) of the inner member (30B) located between the first orifice (34B) and the second orifice (36B) and terminates at the first end proximate the nozzle (14B). The fixed member (39B) may be curved in the region above the first orifice (34B) as described in relation to the first embodiment of the invention. Alternatively, the fixed member (39B) may be substantially linear in the region above the first orifice (34B) and instead comprise two intersecting linear walls such as is shown in Figure 11.

[0057] In other embodiments of the inner member (30B), the region depicted as the chamber (35B) in Figure 11 may alternatively comprise a vertically extending channel which projects upwardly from the second orifice (36B) and intersects with the air entry portion (38Ba). Thus in some embodiments the inner member (30B) may comprise a longitudinal channel and a vertical channel formed therein. The region depicted as chamber (35B) may therefore be substantially solid aside from said longitudinal channel and said vertical channel. When the control means (50B) is moved to an open position the vertical channel defines a pathway through the air flow portion of the flow control assembly (28B) and the second neck portion (12D).

[0058] In further embodiments, the inner member (30B) may comprise a first orifice (34B) and a second orifice (36B) wherein the circumference or perimeter each respectively defining the first orifice (34B) and/or the second orifice (36B) comprises at

least one curved edge and at least one straight edge. In certain embodiments, the circumference or perimeter defining the first orifice (34B) comprises at least one curved edge and two straight edges. In such embodiments, a portion of the first orifice (34B) may be substantially V-shaped. Such a configuration enables enhanced control of fluid flow as the inner member (30B) moves with the control means (50B) to an open position. In further embodiments, the second orifice (36B) is elongated such that it comprises a slot.

[0059] The third embodiment of the invention may comprise a control means (50B) with the same features as described in relation to the first embodiment of the invention. With reference to Figure 13, the container (100B) in accordance with the third embodiment of the invention is shown with the flow control assembly (20B) in a closed position (see Figure 13A)) and in an open position (see Figure 13B)). Furthermore, the container (100B) may comprise supplementary features proximate the control means (50B). For example, the region of the handle 16C adjacent to the control means (50B) may comprise a stump 21B such as that depicted in Figure 12. Handle 16C may be proximate or juxtaposed to the control means (50B) and flow control assembly (20B). The positioning of the handle 16C and inclusion of the stump (21B) may provide further structural reinforcement and stability to the flow control assembly (20B).When the container (100B) includes a stump (21B), the interior of the handle 16C may be hollow or solid.

[0060] In all embodiments of the invention, the reservoir (10, 10A, 10B) of the container (100, 100A, 100B) comprises a chamber (10a, 10Aa, 10Ba) for the storage of fluids, preferably oil. In a preferred case, the capacity of the container (100, 100A, 100B) is 5 litres. However, the capacity of the container (100, 100A, 100B) is not to be limited in this regard and the reservoir (10, 10A, 10Ba) could be adapted such that the capacity of the container is, for example, 2L, 3L, 4L, 6L, 7L or, alternatively, a container of any given capacity which is designed to be handled by a user and has a sufficient volume to exacerbate the "glugging" phenomenon resulting from the ingress of air as fluid leaves the container during the pouring operation. The body (90, 90A, 90B) and reservoir (10, 10A, 10Ba) of container (100, 100A, 100B) is formed from a plastics material. Any plastics material having the required degree of resilience, dimensional stability and resistance to attack by the fluids to be placed in the container (100, 100A, 100B) are suitable for this purpose. Suitable plastic materials include, for example, high-density polyethylene. Typically, the body (90,90A, 90B) and reservoir (10, 10A, 10B) is manufactured by blow moulding. In some embodiments, the body (90, 90A, 90B) of the container may be unitary. Additionally, the container of the invention may include one or more tamper evident features. For example, the control means (50, 50A, 50B) may incorporate a tamper evident tab.

[0061] In embodiments of the invention comprising more than one neck connecting the flow control assembly (20A) to the reservoir (10A), such as described in relation to the second embodiment of the invention with reference to Figures 6 to 8, tubular member (16B) defines a portion of a duct (17A), along which both air and fluid can flow (See Figure 6). The duct (17A) is connected to the reservoir (10A) by lower joining portion (16Aa) and upper joining portion (16Ab). Lower and upper joining portions (16Aa and 16Ab) may respectively comprise a hollow portion so that fluid can flow between the reservoir (10A) and the duct (17A). The hollow portion within the joining portions (16Aa and 16Ab) also permits air to flow from the duct (17A), through the joining portions and to the reservoir (10A). In one embodiment, only the lower joining portion (16Aa) comprises a hollow portion. In another aspect of this embodiment, the upper joining portion (16Ab) is crimped.

[0062] The container (100, 100A, 100B) in accordance with the invention provides an improved means for controlling the flow of fluid dispensed. In the first and third embodiments of the invention, operation of the device is commenced by first unscrewing the cap (15, 15B) and rotating the tap (51, 51B) of the control means (50, 50B) to an open position. Movement of the control means (50, 50B) to an open position causes a simultaneous movement of the inner member (30, 30B) so that a portion of the respective first and second orifices (34, 34B and 36, 36B) of the inner member (30, 30B) overlap with a portion of the respective first and second orifices (24, 24B and 26, 26B) of the housing (22, 22B). External air flows through the air inlet (38) and along the channel defined by the air entry portion (38a) into the internal space defined by chamber (35, 35B) of the inner member (30, 30B). In some embodiments, air flows through a longitudinal channel and a vertical channel formed in the inner member (30, 30B). Air then flows through a through-hole (46, 46B) created by the overlap of the second orifice (36, 36B) of the inner member (30, 30B) and the second orifice (26, 26B) of the housing (22, 22B) and through the respective air flow portions (28, 28B and 13, 12D) of flow control assembly (20, 20B) and neck (11, 11A) via channel (13a, 12Da) which defines a portion of the duct (18, 18B). In some embodiments, the air flows along connecting member (12E) via the mid-section (18Ba) of duct (18B) within the body of the container before entering the hollow portion of the handle (16, 16B). Air continues to flow along duct (18, 18B), through the hollow portion of the handle (16, 16B) and into the reservoir (10, 10B). A portion of the air flow path from the external atmosphere, to the reservoir (10, 10B) is thus shown in Figures 3 and 11 by arrow A.

[0063] When a pouring operation is commenced, fluid from the reservoir (10, 10B), flows along the respective fluid flow portions (27, 27B and 12, 12Ca) of flow control assembly (20, 20B) and neck (11, 11A), through a through-hole (44, 44B) created by the overlap of

the first orifice (34, 34B) of the inner member (30, 30B) and the first orifice (24, 24B) of the housing (22, 22B). Fluid then flows along the fluid dispensing portion (40a, 40Ba) and out through the fluid outlet (40). In some embodiments, if the tilting of container (100) is sufficiently steep, the fluid will flow against the curved portion of dividing wall (39) before being directed along the fluid dispensing portion (40a) and out through the fluid outlet (40). A portion of the fluid flow path from the reservoir (10, 10B) is shown in Figure 3 and Figure 11 by arrow B.

[0064] In embodiments of the invention comprising more than one neck connecting the flow control assembly (20A) to the reservoir (10A) such as those described with reference to Figures 6 to 8, operation of the device is commenced by first unscrewing the cap (15A) and rotating the tap (51A) of the control means (50A) to an open position. Movement of the control means (50A) to an open position causes a simultaneous movement of the inner member (32A) so that a portion of the respective first and second orifices (34A, 36A) of the inner member (32A) overlap with a portion of the respective first and second orifices (24A, 26A) of the housing (22A). In preferred embodiments wherein air is only permitted to enter the air inlet (38A) when the control means (50A) is in an open position, external air flows through the air inlet (38A) and into the internal space of the tubular inner member (32A). In one preferred embodiment as shown in Figure 7, air enters through the air inlet (38A) via recess (33A) formed in the gap between the shoulder portion (23A) of the housing (22A) and the wall of the inner member (32A) or the cylindrical portion of the control means (52A). Air then flows through a through-hole (46A) created by the overlap of the second orifice of the inner member (32A) and the second orifice of the housing (22A), through second neck portion (12B) and along the conduit or passage defined by the duct (17A). Once air has entered the duct (17A), air can communicate with the reservoir (10A) via lower and upper joining portions (16Aa, 16Ab). In a preferred embodiment, air can only communicate with the reservoir (10A) via lower joining portion (16Aa). The air flow path from the external atmosphere, to the reservoir (10A) is thus shown in Figure 6 by arrow A. When a pouring operation is commenced, fluid from the reservoir (10A), flows along first neck portion (12A), through a through-hole (44A) created by the overlap of the first orifice (34A) of the inner member (32A) and the first orifice (24A) of the housing (22A), along fluid discharge portion (40Aa) and out of nozzle dispensing means (14A). The fluid flow path from the reservoir (10A) via first neck portion (12A) is shown by arrow B. As fluid is discharged from the container (100A) along pathway B, external air enters the container through the air inlet (38A) and travels along pathway A, to equalize the pressure difference created by the discharge of the fluid.

[0065] In all embodiments, the container (100, 100A, 100B) of the present invention

provides two independent pathways, one pathway for fluid to be discharged from the container and a second pathway exclusively for air to flow into the container. As fluid is discharged from the container (100, 100A, 100B) along a first pathway, external air enters the container through the air inlet (38, 38A) and travels along a second pathway to equalize the pressure difference created by the discharge of the fluid. This ensures that the fluid can be poured in a smooth, even fashion and avoids the alternating or sporadic "glugging" action experienced with containers of the prior art. In addition, the inner member (30, 32A, 32B) and the housing (22, 22A, 22B) are arranged so that they are inclined and slope downwardly towards the control means (50, 50A. 50B) to allow fluid to flow naturally back along the fluid discharge portion (40a, 40Aa, 40Ba) and through the first orifice (24, 24A, 24B) to re-enter the reservoir (10, 10A, 10B) once the pouring operation is completed. This ensures that fluid does not collect in the nozzle area (14, 14A, 14B) and thus reduces the risk of leakage. Typically, the angle of inclination may be from 5 to 15 degrees.

[0066] The container (100, 100A, 100B) of the present invention also provides an effective means of controlling the flow of fluid discharged from the nozzle (14, 14A, 14B) by allowing the extent of overlap of the respective first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B) to be adjusted. When the tap (51, 51A, 51B) of the control means (50, 50A, 50B) is rotated so that there is only a small degree of overlap between the first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B), the cross-sectional area of the respective through-holes is also small. Consequently, the flow rate of fluid dispensed from the container (100, 100A, 100B) is comparatively lower than when the degree of overlap between the first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B) is large. A maximum flow rate of fluid can thus be achieved when the first and second orifices of the housing (22, 22A, 22B) and the first and second orifices of the inner member (30, 32A, 30B) are in registry with each other (i.e. completely overlapping). The flow control assembly (20, 20A, 20B) of the invention therefore allows a multitude of different flow rates to be pre-set by adjusting the position of the control means (50, 50A, 50B) before commencing the pouring operation. Furthermore, the control means (50, 50A, 50B) can be adjusted incrementally during the pouring operation at the user's convenience to either increase or decrease the flow rate. The container of the present invention thus enables active control of the fluid flow. Alternatively, the user may optionally rotate the tap (51, 51A, 51B) of the control means (50, 50A, 50B) such that the first orifice of the housing (24, 24A, 24B) is in partial overlap with the first orifice of the inner member (34, 34A, 34B) but no overlap exists between the second orifice of the housing (26, 26A, 26B) and the

second orifice of the inner member (36, 36A, 36B). In this configuration the container will operate as a conventional fluid dispenser.

[0067] The inclusions of supplementary safety features on the container (100, 100A, 100B) ensure the user cannot inadvertently adjust the control means (50, 50A, 50B) to allow a flow rate which is too high. This is achieved by incorporating a pip or abutment surface on the control means (50, 50A, 50B) which abuts a corresponding pip formed on the internal wall of the inner member (30, 32A, 30B) or the housing (22, 22A, 22B) once the tap or turning means (51, 51A, 51B) has been rotated beyond a certain point. The user may then only continue to turn the tap or turning means (51, 51A, 51B) by applying additional torque or force to overcome the resistance and permit further movement (to allow movement to a position where the orifices on the inner member (30, 32A, 30B) and housing (22, 22A, 22B) are fully overlapped for example).

[0068] Throughout the description and claims of this specification, the words "comprise" and "contain" and variations of them mean "including but not limited to", and they are not intended to (and do not) exclude other moieties, additives, components, integers or steps. Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity, unless the context requires otherwise.

[0069] Features, integers, characteristics, compounds, chemical moieties or groups described in conjunction with a particular aspect, embodiment or example of the invention are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith. All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive. The invention is not restricted to the details of any foregoing embodiments. The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

[0070] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

CLAIMS

1. A container comprising:

a fluid reservoir;

a first flow path for dispensing fluid;

a second flow path for permitting the entry of air into the container so that air can communicate with the fluid in the container;

wherein the first flow path and the second flow path are spatially separate;

a flow control assembly comprising a control means wherein the control means is moveable between a first position in which the first flow path and the second flow path are closed and a second position in which the first flow path and the second flow path are open;

a duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path when the control means is moved to a second position; and

at least one gripping means;

wherein a portion of said gripping means is hollow and defines a portion of said duct.

2. A container as claimed in claim 1, wherein said flow control assembly comprises an air entry portion and a fluid dispensing portion.

3. A container as claimed in any preceding claim, wherein fluid in said first flow path cannot communicate with air in said second flow path.

4. A container as claimed in any preceding claim, further comprising a body and one or more neck portions wherein the one or more neck portions connect the flow control assembly to the body.

5. A container as claimed in claim 4, wherein said flow control assembly is coupled to said one or more neck portions.

6. A container as claimed in claim 4 or 5, wherein the one or more neck portions comprise a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path.

7. A container as claimed in claims 4, 5 or 6 when dependent on claim 2, wherein the flow control assembly is configured to define a fluid flow portion from a first neck

portion to the fluid dispensing portion and an air flow portion from the air entry portion to a second neck portion when the control means is moved to a second position.

8. A container as claimed in claim 4, wherein the container body is shaped so as to define a section of said duct extending from the flow control assembly to the reservoir for the passage of air via the second flow path.

9. A container as claimed in any preceding claim, wherein said flow control assembly comprises a housing and preferably wherein the flow control assembly further comprises an inner member mounted in the housing wherein the inner member is moveable in the housing and more preferably wherein the inner member is rotatably mounted in the housing.

10. A container as claimed in claim 9, wherein said housing comprises a first orifice and a second orifice and wherein fluid from the first flow path is dispensed via said first orifice and air from the second flow path flows through the housing via said second orifice and preferably wherein the inner member comprises a first orifice and a second orifice and wherein said first orifice and said second orifice of the inner member are adapted to align with said first orifice and said second orifice of the housing when the control means is moved to a second position.

11. A container as claimed in any preceding claim, wherein the control means can be moved to a plurality of different positions.

12. A container as claimed in claim 1 or claim 8, wherein the duct terminates proximate the reservoir.

13. A container as claimed in any preceding claim, comprising a neck portion extending between the flow control assembly and the fluid reservoir, said neck portion comprising a fluid flow portion for dispensing fluid from the first flow path and an air flow portion for the passage of air via the second flow path.

14. A container as claimed in claim 9, wherein said inner member comprises an air entry portion and a fluid dispensing portion separated by a fixed member.

15. A container as claimed in any of claims 2 to 14, wherein the fluid dispensing portion comprises a fluid outlet and the air entry portion comprises an air inlet wherein the cross-sectional area of the fluid outlet is greater than the cross-sectional area of the air inlet.

16. A container as claimed in claim 1, wherein the container comprises at least two spaced apart neck portions, including a first neck portion for dispensing of fluid via the

first flow path and a second neck portion comprising said duct for the passage of air via the second flow path when the control means is moved to a second position.

17. A container as claimed in claim 16, when depending through claim 2, wherein the fluid dispensing portion and the air entry portion are located at distant ends of the flow control assembly.

18. A container as claimed in claim 9, or any of claims 10 to 17 when depending through claim 9, wherein the flow control assembly comprises an inner member and wherein the inner member is inclined at an angle of from 5 to 15 degrees.

19. A container as claimed in claim 1 wherein said at least one gripping means is juxtaposed to said flow control assembly.

20. A container as claimed in any preceding claim, wherein the fluid is oil.

21. A container as claimed in any preceding claim, wherein said container comprises a plastics material and preferably wherein said plastics material is high density polyethylene.

22. A container as claimed in any of claims 4 to 21, wherein the body of the container is unitary.

23. A container as claimed in any preceding claim, wherein the capacity of the container is from 3 to 7 litres and preferably wherein the capacity of the container is from 4 to 6 litres.

24. A method of dispensing a fluid comprising the steps of:
providing a container as claimed in any of claims 1 to 23;
moving the control means to a second position; and
tilting the container to dispense the fluid.

25. A method according to claim 24, further comprising the step of: moving the control means during the dispensing operation to adjust the rate of flow.