Nov. 18, 1958 L. A. FALLIGANT 2,860,820

ASSEMBLY AND LOCKING MEANS FOR LIQUID HANDLING DEVICES

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Fig. 1

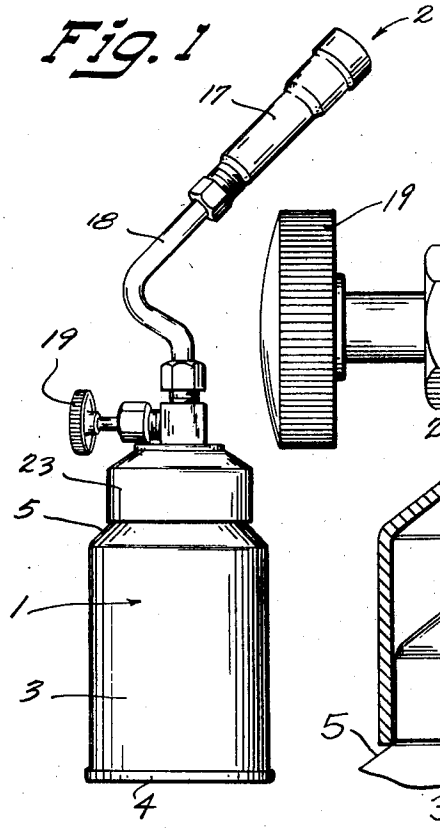


Fig. 4

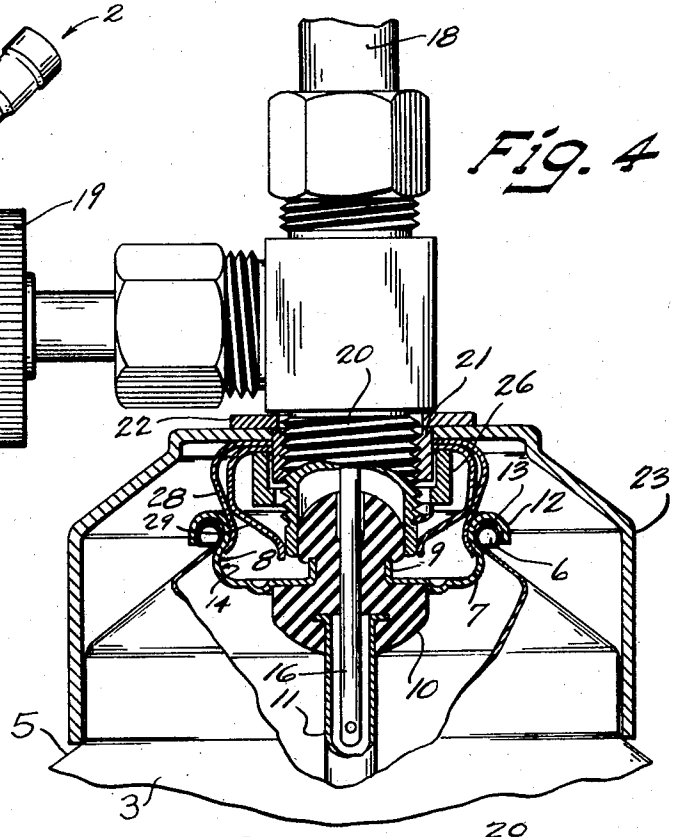
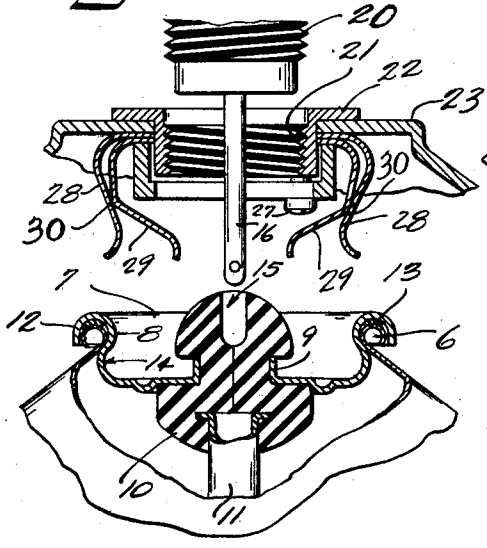


Fig. 2



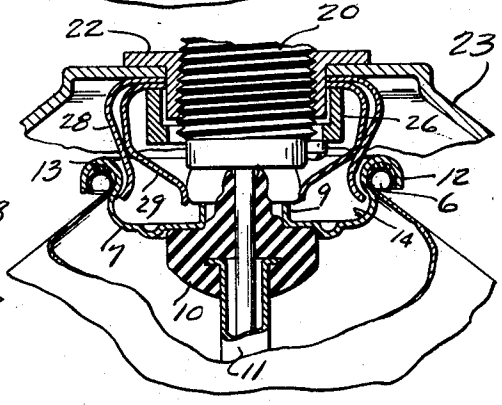


Fig. 3

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Fig. 5

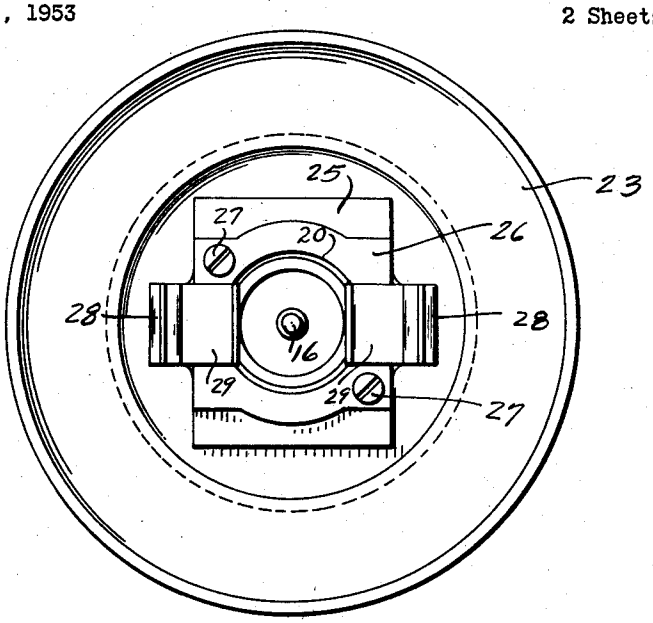


Fig. 6

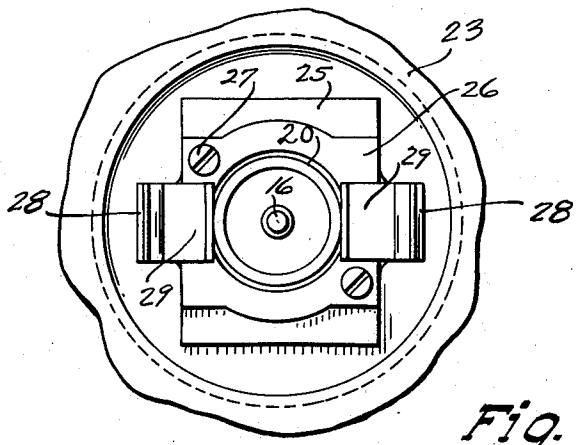
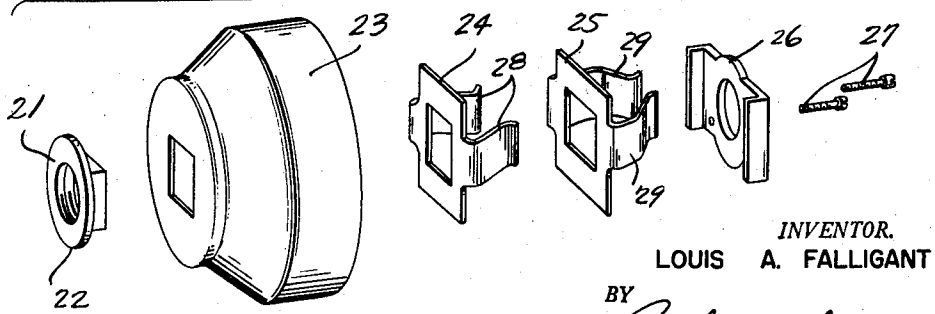


Fig. 7



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United States Patent Office 2,860,820
Patented Nov. 18, 1958

2,860,820

ASSEMBLY AND LOCKING MEANS FOR LIQUID HANDLING DEVICES

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Application July 30, 1953, Serial No. 371,213

8 Claims. (Cl. 222—82)

This invention relates to coupling means for removably securing and connecting liquid containers and dispensing means or other devices.

The invention provides for the selective removal and attachment of the device with a container by means providing an internal lock which is concealed and firmly secures the two parts together.

An object of the invention is to facilitate the more secure attachment of the parts.

Another object is to provide for securement of the parts by turning of one part relative to the other.

Another object is to provide a more serviceable expandable locking means for one part to engage the complementary portion of the other part to be secured thereto.

Another object is to provide for the firm support of the device or the relative locking of the parts in rigid relation.

These and other objects and advantages will be more fully set forth in the description of the invention as illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a perspecive view of a portable blow torch embodying the invention and including a fuel container and burner assembly which are separable to allow replacement of containers to renew the supply of fuel;

Fig. 2 is an enlarged section through the base of the burner assembly showing the same prior to connection with the fuel container;

Fig. 3 is a view similar to Fig. 2 showing the assembly connected with the container to receive the fuel therefrom and prior to locking of the assembly thereto;

Fig. 4 is a view similar to Fig. 3 showing the burner assembly locked with the container;

Fig. 5 is a bottom plan view of the locking mechanism in retracted position;

Fig. 6 is a view similar to Fig. 5 showing the locking mechanism expanded to engage a part of the container, not shown; and

Fig. 7 is an exploded perspective view of the disassembled parts of the locking mechanism and base of the burner assembly.

The invention is illustrated as applied to the construction of a portable blow torch such as that described and claimed in United States Patent No. 2,683,484 granted to the present inventor on an application copending herewith and filed October 30, 1950, the present application constituting a continuation-in-part thereof.

The embodiment of the invention shown in the drawings includes the liquid fuel container 1 and the torch 2 which is secured to the container and is connected therewith to receive a fuel supply from the container under pressure.

The container 1 includes the generally cylindrical shell 3 which is closed by the concave lower end 4 and has a

reduced upper cylindrical end which provides the annular outer shoulder 5 near the upper end of the container. A circular opening in the upper end of shell 3 is defined by the rolled edge 6 and provides for filling the container with fuel or other liquid under pressure. The circular cap 7 closing shell 3 has an outer flange 8 and an inner flange 9 which latter defines a central opening.

The rubber grommet 10 is press-fit within the opening of cap 7 and supports the upper end of the dip tube 11 which depends within the container to the lower part thereof.

The marginal portion of flange 8 is rolled outwardly and downwardly as at 12 and fits over the rolled edge 6 of shell 3 with the gasket 13 therebetween to effect the closure of shell 3. Cap 7 is secured by expanding the same at the base of flange 8 to extend beneath the rolled edge 6 of shell 3 which provides an annular groove 14 extending generally concentrical of grommet 10.

Grommet 10 is provided with the recess 15 in its upper end to receive the hollow delivery conduit or needle 16 of the torch. Needle 16 is tubular and extends through the grommet and enters the upper part of tube 11 to receive pressurized fuel from within the container while the grommet maintains a firm contact with the outside of needle 16 to prevent leakage of fuel.

The torch includes the burner 17, delivery tube 18 and the valve unit 19 which supports the tube and burner. The lower threaded base 20 of the valve unit turns into the internally threaded fitting 21 which has a non-circular outer dimension and an upper flange 22. The bell-shaped member or shroud 23 and springs 24 and 25 are provided with corresponding non-circular central openings to receive fitting 21 and the lower plate 26 is adapted to receive the screws 27 which extend therethrough to secure the springs in assembled relation on fitting 21 and within the shroud.

Shroud 23 is adapted to fit over the reduced upper end of shell 3 to guide needle 16 into recess 15 of grommet 10 in entering the container. Springs 24 and 25 when disposed in assembled relation within shroud 23 include cooperating arms 28 and 29 respectively, which extend downwardly on corresponding opposite sides of grommet 10 and within flange 8 of cap 7. The arms 28 of spring 24 have square lower ends which extend outwardly of each other respecting the center of fitting 21 and needle 16.

Spring 25 is dimensioned generally to be assembled within spring 24 and with the non-circular opening of each in registry to receive fitting 21 as described. In assembled relation, the arms 29 of spring 25 are curved to fit between and engage arms 28 of spring 24 as at 30 some distance from the ends of the arms. The lower ends of arms 29 extend toward each other and terminate beneath fitting 21 and within the path of movement of the threaded base 20 when turned in one direction to move downwardly in the fitting.

The lower end of torch 2 is threaded within fitting 21 and the torch is connected to container 1 by inserting the end of the needle 16 in recess 15 of grommet 10 and pushing the needle through the grommet into tube 11 until shroud 23 is seated on shoulder 5 of shell 3 to support torch 2 rigidly thereon. Thereafter the torch is turned in fitting 21 so that the threaded base 20 moves downwardly in the direction of the shell to engage arms 29 of spring 25 and deflect the same in opposite directions to open the spring. The engagement of arms 29 as at 30 with the arms 28 of spring 24 actuates the opening of the latter so that the arms 28 thereof are expanded or moved outwardly and away from each

other and the square ends of the arms enter groove **14** of the cap **7**. At the same time, the lower end of base **20** passes down over grommet **10** to form a seal therewith.

The torch **2** is removed from container **1** by rotating base **20** of the torch in the other direction which withdraws the lower end of the base and allows springs **24** and **25** to be released and arms **28** to disengage flange **8** of cap **7** which then permits the removal of the torch from the container and the withdrawal of needle **16** from grommet **10**.

Arms **28** may be dimensioned to slightly engage the rolled flange **8** of cap **7** upon assembly to provide a snap-action which secures the torch and container together while the base **20** is turned in fitting **21**.

The springs **24** and **25** comprise the movable elements of the locking means and are readily assembled as shown in Fig. 7. The square ends of arms **28** of spring **24** are of suitable spring steel which is a hard metal particularly by comparison with the softer metal of cap **7**. Arms **28** will cut into the metal of cap **7** when turning of shroud **23** is attempted and such turning is effectively prevented as desired.

The separate spring construction of the movable locking elements and the actuating elements allows for wide dimensional variations within the limited dimensions of cap **7**.

Various embodiments of the invention may be employed within the scope of the following claims.

I claim:

1. In a device of the class described, a fluid container having a cup shaped sealed outlet cap with its circumferential flange pressed over a rolled edge of the container and providing an undercut annular recess beneath the edge, a rubber-like grommet secured centrally of the cap, a valve unit having a base for securement to said container and a delivery conduit adapted to extend centrally through said grommet and to seal therewith to establish communication between said container and valve unit for transfer of the fluid therebetween, locking means carried by said base and adapted to enter said cap generally concurrently with the entry of said delivery conduit through said grommet, said locking means being arranged about said delivery means for expansion into the recess of the flange of said container cap, and means to expand the locking means into positive engagement with said container cap within said recess thereof.

2. The invention as defined in claim 1 wherein said last-named means comprises a rotatable member threaded to said base, and cam means on said base for expanding said locking means upon threading of said base and member in one direction and releasing said locking means for contraction upon threading of the same in the opposite direction.

3. In a device of the class described including a generally cylindrical liquid container with an annular shoulder near the upper end thereof and having a closure cap seated within the opening of the container to close the same and having an elastic grommet providing a sealed outlet for the container, said container having an annular outer ridge concentric with said sealed outlet and said cap having an annular undercut recess beneath said ridge and concentric with respect to said sealed outlet, a valve unit for connection with said container having a threaded base and a hollow needle carried by said base and adapted to enter said sealed outlet to receive the contents of the container, a circular bell-shaped member having a downwardly extended circular flange adapted to be seated on the annular shoulder of said container and having a non-circular center opening, a corresponding non-circular fitting adapted to be secured in the opening of said member and having a central threaded opening to receive the threaded base of said valve unit, the end of said base being movable axially into said member by relative rotation thereof in one direction, spring members having non-circular openings to fit over said fitting within said member and having opposite flexible arms projecting downwardly and normally disposed to enter the recess of said cap, the corresponding arms of the lowermost of said spring members being disposed to be engaged by the end of said base of the delivery tube by rotating the same relative to said member, the arms of said uppermost spring member being engageable by said other arms to be moved in opposite directions of each other and into the undercut recess of said container cap to securely lock the valve unit in an assembled relation with said container, the depending flange of said bell-shaped member being seated on the rim of the container to provide rigidity for the assembly.

4. The construction of claim 1 in which said locking means is secured to the base by a member threaded to the base of said valve unit and the further threading thereof actuates said expanding means.

5. The construction of claim 1 in which a bell shaped circular shroud is carried by said valve unit and has a lower circular edge adapted to engage a circumferential portion of the container to add rigidity to the assembly.

6. In a device of the class described, a fluid container having a cup shaped sealed outlet cap with its circumferential flange pressed over a rolled edge of the container and providing an undercut annular recess beneath the edge, a rubber-like grommet secured centrally of the cap, a valve unit having a base for securement to said container and a delivery conduit adapted to extend centrally through said grommet and to seal therewith to establish communication between said container and valve unit for transfer of the fluid therebetween, locking means carried by said base and adapted to move into a position adjacent said rolled edge generally concurrently with the entry of said delivery conduit through said grommet, said locking means being arranged circumferentially about said delivery means for radial movement into said undercut annular recess beneath said rolled edge, and means to actuate said locking means into positive engagement in said recess.

7. In a device of the class described, a fluid container having a cup shaped sealed outlet cap with its circumferential flange pressed over a rolled edge of the container and providing an undercut annular recess beneath the edge, a rubber-like grommet secured centrally of the cap, a valve unit having a base for securement to said container and a delivery conduit adapted to extend centrally through said grommet and to seal therewith to establish communication between said container and valve unit for transfer of the fluid therebetween, locking means carried by said base and adapted to move into a position adjacent said rolled edge generally concurrently with the entry of said delivery conduit through said grommet, said locking means being arranged circumferentially about said delivery means for radial movement into said undercut annular recess beneath said rolled edge, a rotatable member threaded to said base concentrically of said central delivery tube, and cam means on said base for actuating said locking means to locking position upon threading of said base and member in one direction and releasing said locking means for unlocking the same upon threading of the same in the opposite direction.

8. In a device of the class described, a fluid container having a cup shaped sealed outlet cap with its circumferential flange pressed over a rolled edge of the container and providing an undercut annular recess beneath the edge, a rubber-like grommet secured centrally of the cap, a valve unit having a base for securement to said container and a delivery conduit adapted to extend centrally through said grommet and to seal therewith to establish communication between said container and valve unit for transfer of the fluid therebetween, locking means carried by said base and adapted to move into a position adjacent said rolled edge generally concurrently with the entry of said delivery conduit through said

grommet, said locking means being arranged circumferentially about said delivery means for radial movement into said undercut annular recess beneath said rolled edge, means to releasably actuate said locking means into positive engagement in said recess, and a circular shroud carried by said valve unit base to cover said locking means and protect the same, said shroud having a lower edge adapted to engage a circumferential portion of the container to add rigidity to the assembly.

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