July 25, 1967 T. D. NISBET ETAL 3,332,457

DISCHARGE SPOUT

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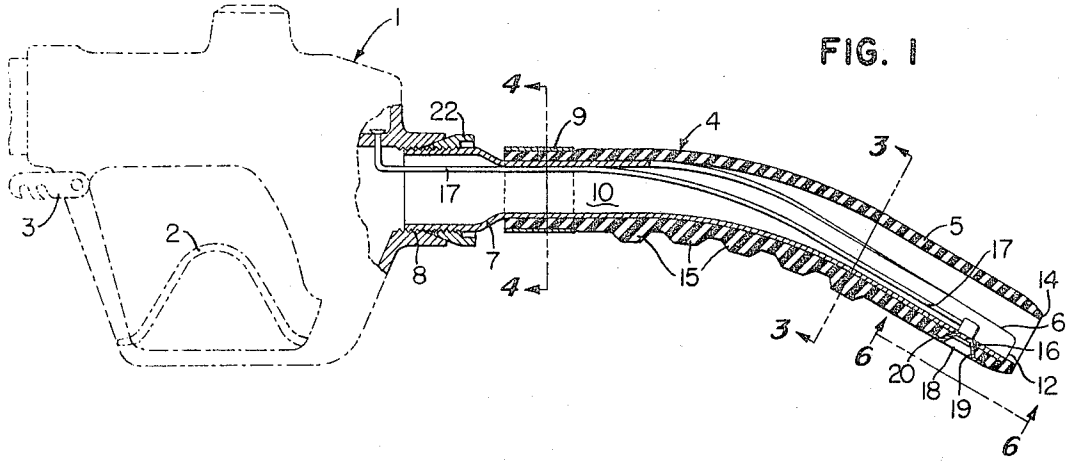


FIG. 1

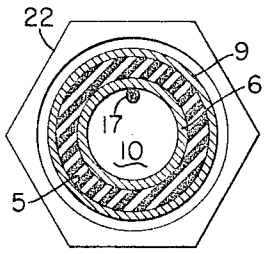


FIG. 4

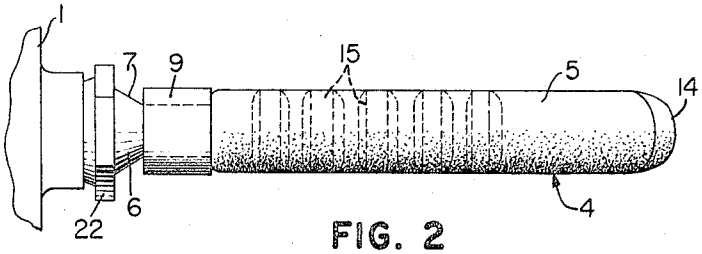


FIG. 2

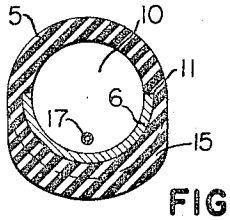


FIG. 3

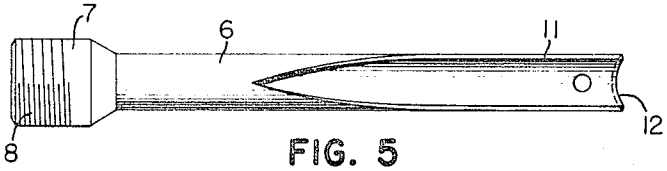


FIG. 5

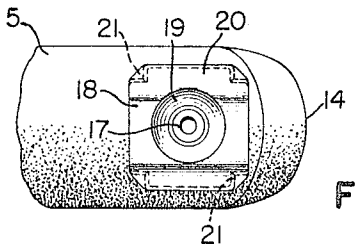


FIG. 6

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DISCHARGE SPOUT

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This invention relates to a dispensing nozzle for use with fluid dispensing apparatus and more particularly to a spout for use with an automatic shut-off nozzle through which gasoline flows into a vehicle gas tank.

For the past several years there has been a large expansion in the number of service stations selling gasoline to the public and simultaneously there has been substantial modernization and updating of the equipment in the existing stations. Almost universally, the automatic nozzle is a standard item on the gasoline dispensing pumps in the modern service station. A nozzle of this type, when placed in the filler neck of the gas tank, permits the attendant to go about his other duties such as checking oil, water, wiping the windshield, etc. while the gas tank is being filled, as the nozzle will automatically shut off when the gas reaches the spout in the filler neck.

The presently available nozzles have a rigid metal spout attached to the nozzle from which the gas enters the tank. The spout is of a generally arcuate contour so as to hold the nozzle in the proper operating position. An open helical spring surrounds a portion of the spout and abuts against the nozzle to provide means to retain the spout in the filler neck. In some instances, a collar fixed in position on the spout is used to retain the spring on the spout but in many nozzle assemblies the frictional engagement of the spring with the curved spout is the sole means of retaining the spring in position. It is very obvious that many of these springs break during use and the broken portion most likely will end up in the gas tank. If a collar is used, many of them will work loose and likewise end up in the tank. At times either the spring or collar will then become lodged under the gas gauge float, thus disrupting its proper functioning and it is costly to remove the spring or collar from the tank. Furthermore, the broken spring must be replaced in order to use the nozzle in the manner intended.

Since the nozzle and spout along with the spring are of metal, it is very easy for the operator to damage the paint on the automobile by careless handling or the area of the pump adjacent the nozzle hanger on the pump when placing the nozzle thereon after use. The metal to metal contact between the nozzle or spout and either the vehicle or pump very easily may produce static sparks to create a fire or explosion hazard.

Discharge spouts of resilient material such as rubber or plastic have heretofore been made but such spouts have not been of a construction satisfactory for use with an automatic shut-off nozzle. In this invention, the structure of the spout consists essentially of an outer surface of elastomeric material with a rigid metal insert on at least a portion of the interior to provide the desired configuration and rigidity necessary to the proper functioning of the nozzle to which it is attached. The spout of the instant invention has been found to function extremely well when attached to the present day automatic shut-off nozzle in place of the existing nozzle spout without modification of the nozzle. It is, therefore, an object of this invention to provide a spout of resilient material to replace the metal spout currently being used.

A second object of this invention is to provide a spout that includes as an integral part of the spout, means to retain it in position in the filler neck of the gas tank.

A further object of this invention is to provide an improved spout for use with an automatic shut-off nozzle.

Another object of the invention is to provide a nozzle that is of resilient material to prevent, by contact, damage to the automobile or gas pump.

A still further object is to provide a spout that is economical to manufacture.

And still another object is to provide a spout for use with a gas dispensing nozzle that minimizes the danger of creating static sparks.

A further object is to provide a nozzle that is sufficiently flexible so as to be partially deformable to fit the small filler necks of some of the foreign cars, yet permit the gasoline to flow therethrough.

Other objects and advantages of this invention will become apparent hereinafter as the description thereof proceeds, the novel features, arrangements and combinations being clearly pointed out in the specification as well as the claims thereunto appended.

In the drawings:

FIG. 1 is a longitudinal section of the invention;

FIG. 2 is a plan view of the invention;

FIG. 3 is a section taken on 3—3 of FIG. 1;

FIG. 4 is a section taken on 4—4 of FIG. 1;

FIG. 5 is a plan view of a portion of the invention; and

FIG. 6 is a view taken from 6—6 of FIG. 1.

The numeral 1 generally represents a typical automatic shut-off nozzle which includes the valve lever 2 and the latch 3 which in operation engages lever 2 to hold the dispensing valve of the nozzle open until the gas tank is filled. The particular notch in latch 3 that lever 2 engages, determines the rate of flow of gasoline through the nozzle. As the gas reaches the spout in the filler neck, latch 3 is automatically disengaged from lever 2 to shut off the flow of gas. The outlet spout 4 is attached to nozzle 1 in any of the conventional means and one means will be described in more detail later.

Spout 4 is of general arcuate configuration as best seen in FIG. 1 and is formed of a tubular body 5 of elastomeric material such as synthetic rubber, preferably resistant to oils and gasoline and a metal insert 6 in the bore of the body. As shown, the attachment end of insert 6 extends beyond body 5 and the extending portion is expanded radially outwardly to form tubular portion 7 which includes threaded portion 8 on the exterior surface to engage comparable threads on the interior of nozzle 1. A ferrule 9 is crimped around the end of body 5 to hold body 5 and insert 6 in the assembled position. The opening or bore 10 through spout 4 is of a uniform diameter and comparable to that of the existing spouts so as to eliminate any change in the flow characteristics of the spout.

In order to maintain spout 4 in the desired arcuate configuration and forming a portion of the surface of bore 10, insert 6 of aluminum, steel or other metallic material is positioned therein. In the preferred form of insert 6, as best seen in FIG. 5, the portion of insert 6 adjacent the expanded end portion which lies under the end of body 5 is tubular to provide a firm surface for fixing body 5 in position on insert 6 by means of ferrule 9. The tubular portion of insert 6 extends for a short distance from the expanded end, then from that point to the end of the insert it has been found that a substantial half circle cross-section of the insert is sufficient to provide the desired rigidity. As best seen in FIGS. 1 and 5, the half circle portion 11 extends from the end 12 for a substantial portion of downwardly extending portion of insert 6, then gradually blends into the full tubular section. The half circle portion 11 is positioned in lower portion of body 5 and extends therealong to a point spaced from the outlet end 14 of body 5 so that the discharge or outlet end 14 of spout 4 is solely the

resilient body material to eliminate any possible direct metal contact between the spout and either the automobile or gas pump during use. In the preferred form and as shown in the drawings, insert 6 lies in a recess formed in the body 5 so as to provide a smooth, unobstructed bore in spout 4 thus eliminating any flow obstructions to cause turbulence in the gas as it flows through the spout.

Insert 6 may be either adhered to body 5 during the molding and vulcanizing operation so as to form an integral structure or preferably may be slipped into position in bore 10 after body 5 has been formed. In the latter, the recess formed in bore 10 to receive insert 6 provides means to readily and positively position insert 6 without difficulty. Once insert 6 is properly positioned ferrule 9 is slipped over body 5 and crimped or swaged to hold the body 5 and insert 6 in position. By recessing insert 6 into body 5, twisting or turning of the body 5 relative to the insert 6 is prevented. It is more economical to produce the body 5 separately, then slip insert 6 into position, thus eliminating the necessity of initial preparations necessary to obtain adhesion. The assembled construction also permits ready replacement of the body portion in the event that it is damaged during use without replacing the entire spout assembly.

A series of transverse ridges or ribs 15 are formed on the exterior surface of the inner curved portion of body 5 to provide means to retain spout 4 in position in the filler neck of the gas tank. These ridges or ribs 15 may be of any desired cross-sectional shape, but as shown are substantially trapezoidal and extend substantially to the mid-point of the sides of spout 4.

Adjacent the discharge end 14 of spout 4 and on the extreme inner or lower surface of spout 4, an opening 16 extends through body 5 and insert 6 from the outer surface of the nozzle into interior of bore 10 thereof through which the end of the vacuum tube 17 extends. The end of vacuum tube 17 after positioning in opening 16 is premanently fixed therein. One means of fixing the end of vacuum tube 17 is illustrated in FIGS. 1 and 6 in which a thin metal washer 18 having a frusto-conical portion 19 formed centrally therein is positioned in opening 16 of body 5, with the end of vacuum tube 17 extending into the frusto-conical section 19. The end of vacuum tube 17 is then flared so as to firmly fix the vacuum tube in position. Preferably the portion 20 of washer 18 is arcuately shaped to the contour of the body 5 which is recessed to receive washer 18 so that the exterior surface of the spout 4 is substantially smooth. The corners of portion 20 of the washer, if desired, may be turned down to form barbs 21 which bite into body 5 to prevent the washer 18 from turning during use. The attachment and function of vacuum tube 17 to spout 4 is similar to that of the present day nozzles in order to activate the automatic shut-off mechanism of the nozzle when the tank is filled.

In order to attach spout 4 to nozzle 1 after insert 6 and body 5 are assembled, lock nut 22 is first applied to threaded portion 8 of insert 6 and turned to the end of threaded portion 8. The assembly is then threaded into nozzle 1 to the desired position. Lock nut 22 is tightened against nozzle 1 to retain the spout assembly in position. Although not shown, a break-away notch may be formed preferably in the expanded portion 7 so that the spout assembly will break at this point if the car should be driven away before the spout is removed from the filler neck. It is apparent that the particular means by which the spout assembly 4 is attached to the nozzle may be varied in design in order to adapt it for use with any nozzle.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit or scope of the invention.

We claim:

1. A discharge spout of molded elastomeric material for use with a gasoline pump nozzle of the automatic shut-off type to discharge gasoline into a vehicle tank with one end of said spout being attached to said nozzle and the opposite end being that from which the gasoline is discharged, said spout having a generally curved configuration along the length thereof, means on one end of said spout for attachment to said nozzle, an axially extending opening of substantially uniform size extending through the length of said spout, a rigid metal insert in the interior of said opening with a portion of the insert adjacent the discharge end of said spout being substantially semi-circular in cross section and positioned along the curved inner surface to form a lining therefor, the insert being recessed into the elastomeric material sufficiently to provide a smooth substantially unobstructed surface of said opening, the metal insert terminating short of the discharge end of said opening, a plurality of spaced, circumferentially extending ribs on the inner curved portion of the spout and a second opening extending radially from the outer surface of said spout into the axially extending opening of said spout through which a portion of the nozzle extends to fix the position thereof, whereby a rigid spout of curved configuration of resilient material is provided to prevent marring of the vehicle surfaces by contact with the spout and also support the nozzle and spout in the desired position in the filler neck of the vehicle tank.

2. A discharge spout as claimed in claim 1 in which a portion of the length adjacent the attachment end of said metal insert is tubular to provide a rigid surface for clamping the elastomeric spout to said insert.

3. A discharge spout as claimed in claim 1 in which said metal insert has a radially outwardly expanded end portion having threads thereon for attachment to the nozzle whereby the spout may be positively attached thereto.

4. A discharge spout as claimed in claim 1 in which said metal insert is removably inserted in the interior of said spout and lies in a recess in the elastomeric material, said recess being of a configuration to receive and position said insert to form a substantially continuous smooth unbroken interior surface in the opening of said spout.

5. A discharge spout as claimed in claim 4 in which a ferrule is crimped around the spout to compress it against the insert to hold the spout and insert in the assembled position.

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