Sept. 19, 1939. P. L. FRANCOIS 2,173,779

LIQUID POURING SPOUT

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Fig. 1

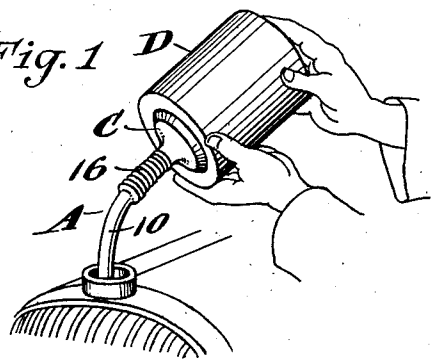


Fig. 2

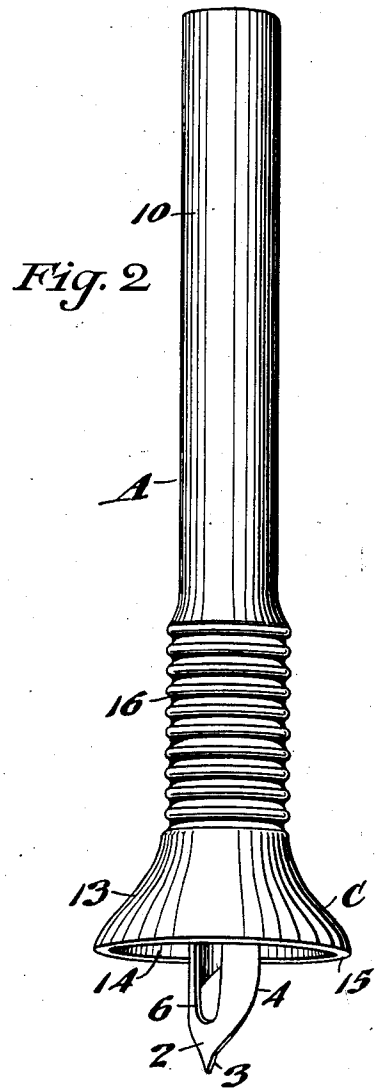
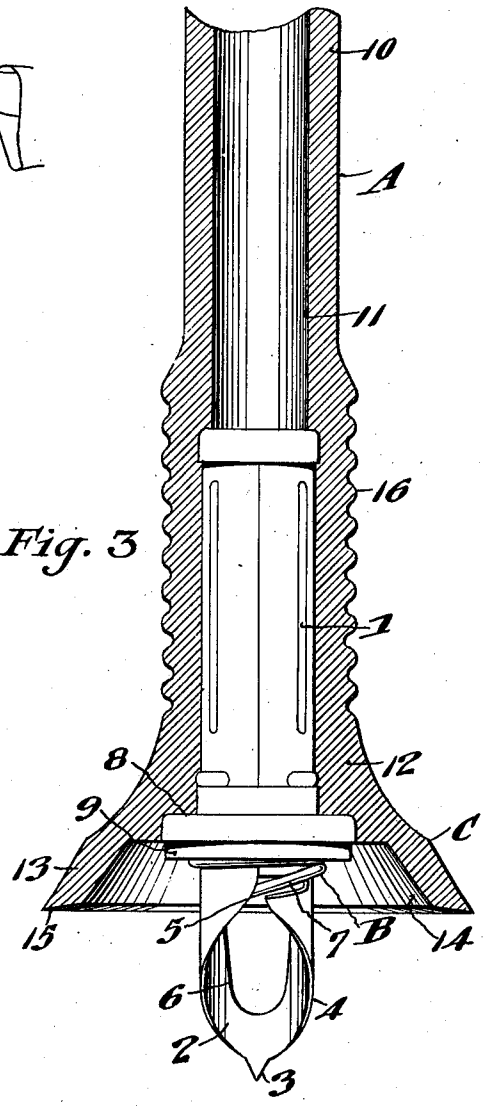


Fig. 3



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Fig. 4

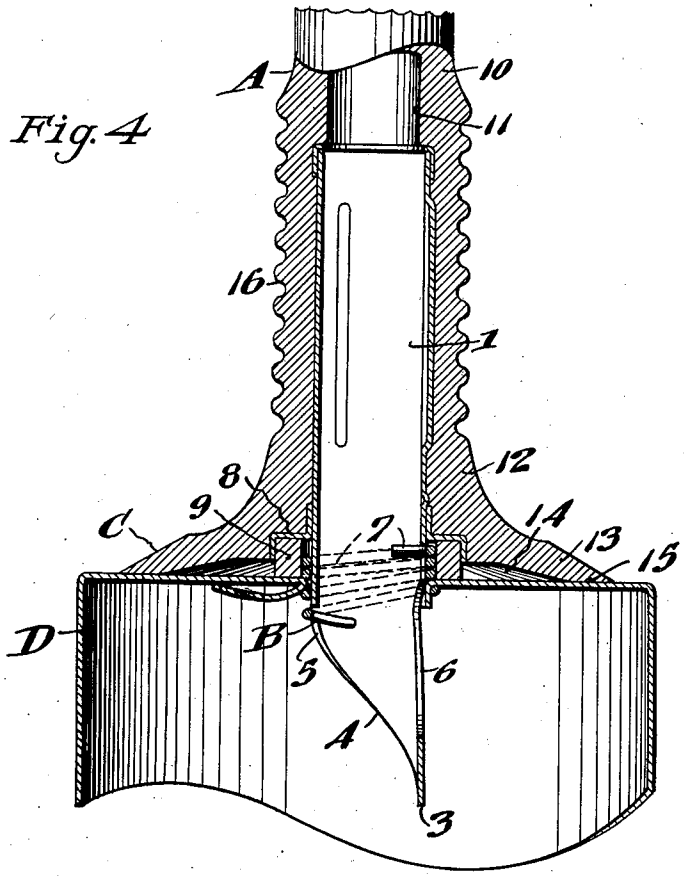
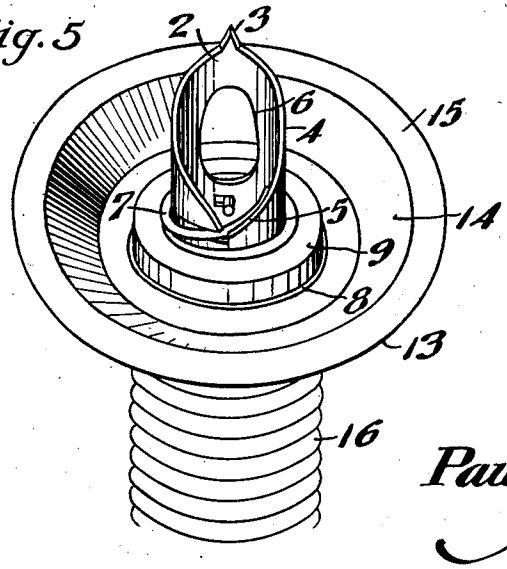


Fig. 5



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LIQUID POURING SPOUT

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Fig. 6.

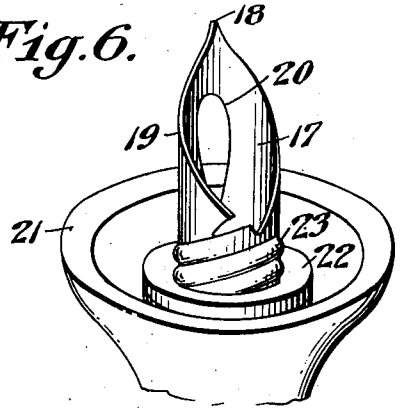


Fig. 7.

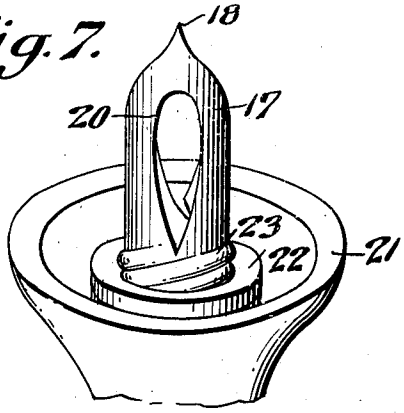


Fig. 8.

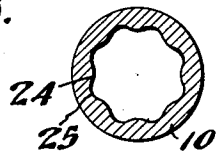


Fig. 9.

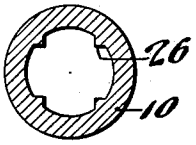


Fig. 10.

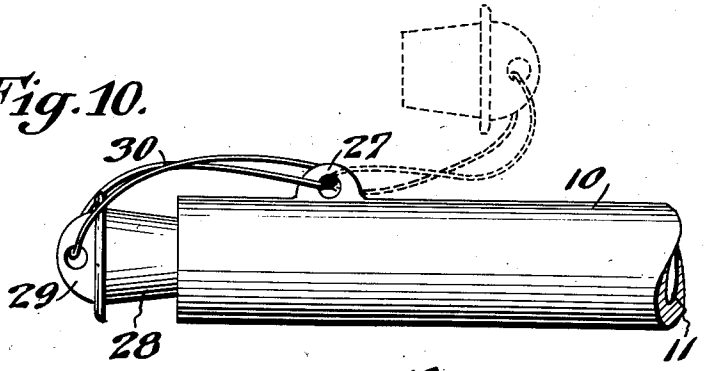
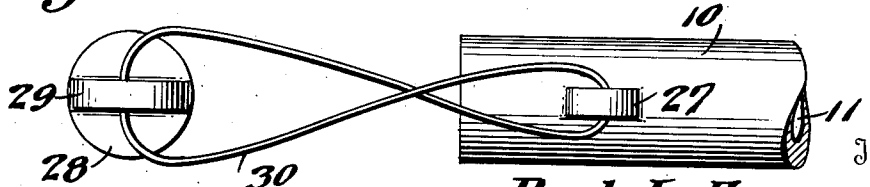


Fig. 11.



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LIQUID POURING SPOUT

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Fig. 12.

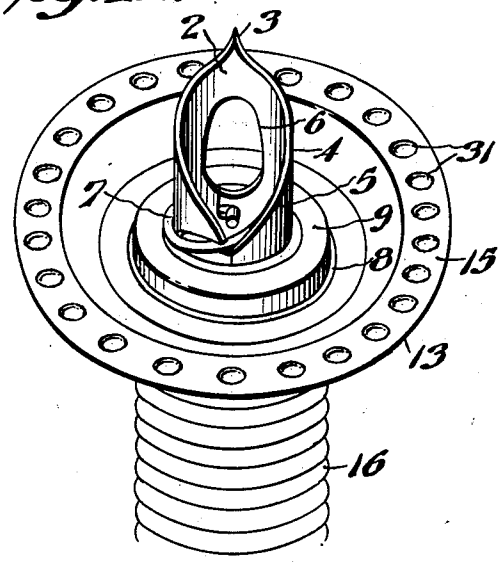


Fig. 14.

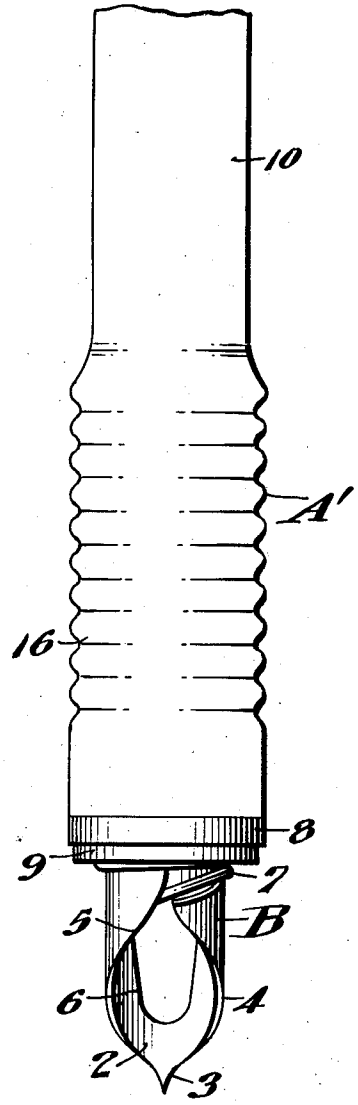
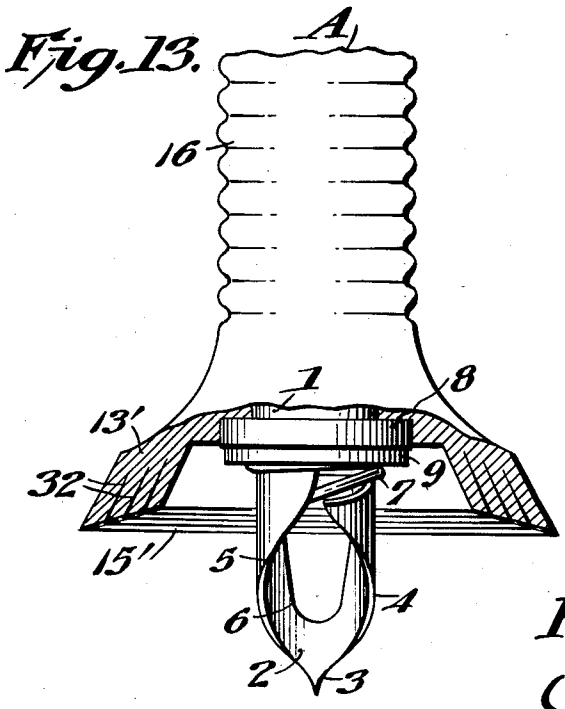


Fig. 13.



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UNITED STATES PATENT OFFICE

2,173,779

LIQUID POURING SPOUT

Paul L. Francois, East Orange, N. J.

Application February 2, 1938, Serial No. 188,371

5 Claims. (Cl. 221—23)

My invention relates to liquid pouring spouts, and particularly to a spout and can opener structure intended and adapted for use in connection with sealed metallic cans, or other like containers or receptacles, to facilitate the opening of the can and the pouring of the liquid, and at the same time assure positive protection against spilling of any of the liquid being poured.

An object of my invention is to provide a device of this character comprising, a pouring spout to be fitted and detachably held at an opening in the container and a resilient cup bearing against the container around the opening to prevent dripping and spilling of any liquid that may find its way through the opening and outside of the spout.

Another object is to provide a pouring spout and can opener structure well and particularly adapted for use in opening sealed sheet metal cans, such as are used to contain radiator anti-freeze liquids and other liquids or solutions ordinarily employed around or in conjunction with an automobile, and which pouring spout is of such nature and construction that the liquid can be readily and freely poured from the can into the filling neck of a radiator, or into any other opening or location about an automobile, or the like, with facility and without danger of spreading or splashing or spilling the liquid, or of the liquid leaking or dropping from the container during the pouring operation.

Still another purpose is to so construct the parts that a flexible pouring spout is provided, which spout can be bent or curved to fit within a radiator filling neck, or other orifice or opening, thus obviating the necessity for use of a funnel and avoiding the likelihood of splashing or spilling of the liquid upon finished surfaces or other parts of an automobile body, or other structure, that might be damaged by the liquid.

Yet another object is to provide means readily adapted to be manipulated to cut or form an opening in and through the can, together with means for holding the pouring spout at the opening of the can, and a cup of resilient material carried by the pouring spout structure and bearing upon the container around the opening to prevent spilling or leakage of the liquid.

Yet a further object is to provide a device of this character of simple and inexpensive construction, in which the parts are readily and cheaply manufactured and assembled, and which can be made of such materials that breakage, displacement of the parts or other injury from shocks and the like in handling or use will be reduced to a minimum.

Another object and purpose is to provide a device of this character in which the pouring spout and the cup can be made of flexible and resilient rubber, and with which the cutting and holding portions are readily incorporated in position for commencement and effective use while the rubber parts are presented externally to be grasped and to give a firm and satisfactory grip for manual manipulation of the device in the placement or attachment and in the removal or detachment.

With the above and other objects in view, some of which will be apparent to those skilled in the art, and others of which are inherent in the construction and use of the device, my invention includes certain novel features of construction and combinations and arrangements and association of parts, which will be hereinafter set forth in connection with the drawings and then pointed out in the claims.

In the drawings:

Figure 1 is a fragmentary perspective view showing my invention applied to a container and in use in pouring the contents thereof into an automobile radiator.

Fig. 2 is a perspective view taken from one side showing the device.

Fig. 3 is an enlarged perspective view with parts in longitudinal section and showing the can cutting and spout securing means in elevation.

Fig. 4 is a fragmentary sectional view taken substantially at right angles to the showing in Fig. 3, and illustrating the device in a position for use.

Fig. 5 is a fragmentary perspective view to better show the cooperative relation of the intake end of the pouring spout and the cup associated therewith.

Figs. 6 and 7 are fragmentary views in perspective, taken from different sides, showing a modified construction of can cutting and attaching means.

Fig. 8 is a detail sectional view taken transversely through the flexible pouring spout showing liquid directing means.

Fig. 9 is a view similar to Fig. 8 illustrating a modified construction.

Figs. 10 and 11 are fragmentary side views, taken from different angles, of the outer or discharge end of the pouring spout and showing means adapted to be used in closing said spout.

Figs. 12, 13 and 14 are fragmentary views showing modified constructions.

With many manufacturers and distributors selling anti-freeze solutions, and other liquids and liquid solutions in cans or other like metal con-

tainers or receptacles, many of which containers or receptacles are sealed by the manufacturers or distributors with the express purpose of insuring against contamination, adulteration or substitution, and assuring the purchaser that he is receiving the original liquid as packed, great difficulty has arisen through the fact that an opening must be formed in the container to permit pouring of the liquid contents, and that the liquid must be poured without spilling or splashing thereof, since alcohol, methanol, and other antifreeze liquids and other liquid solutions will cause costly damage to motor car hood and radiator top or other portions when only a small quantity or a few drops are allowed to spill on the finish; and, it has heretofore been impracticable and substantially impossible to satisfactorily and conveniently pour the liquid from such a container without great likelihood of spilling or leakage and the consequent grave danger of injury to finished surfaces and the like. Further, where the liquid is to be poured from the can or container or receptacle into the small opening of a radiator filler neck, or some other like small opening, it has been necessary to use a funnel or other means to direct the liquid. Even where a funnel is used, when the can or container having the pouring opening therein is tilted the liquid will gush forth with consequent danger of splashing and spattering outside of the confines of the funnel, and there is always possibility that some of the liquid will run down over the side of the can or container, in raising and tilting the same, or in lowering the can, with consequent resultant damage from this dripping or spilling liquid. It is the purpose of my invention to provide a detachable spout for use with closed or sealed tin cans, and similar containers or receptacles, which device can be used for opening a hole in said container, or can be applied at an opening, and which incldes a flexible spout through which the liquid is poured together with a cup fitting against the container around the opening to positively prevent leakage or dripping of the liquid.

Primarily, the device of this invention includes and comprises three main and essential features, namely the pouring spout A, means, B, to detachably connect the spout at the opening of the can or other container or receptacle, and the cup portion C yieldably or resiliently bearing against the container around the opening to prevent spillage and leaking of any of the liquid contents. As shown in the first illustrated embodiment, a tubular body member 1, of sheet metal or other suitable material, has means for entering an opening in the can or container at one end, as generally indicated at 2. This portion 2 includes a penetrating point 3 for originally entering or penetrating the can or container, where the same is to be opened, and the cutting edges 4 recede from this penetrating point 3 on each side rearwardly to terminate on the opposite side, substantially at 5. The portion 2 is made of sheet metal, or of other material, sufficiently hardened or tempered to cut the tin or other material of a sheet metal can, receptacle or container, as the point 3 is pressed downwardly to pierce the sheet metal and the pressure is continued to bring the rearwardly sloping or curved edges 4 into severing contact with the sheet metal. The portion 2 is formed as a continuation of the tubular portion 1, and an opening is provided at 6 through the back of this portion 2 to permit free flow and complete drainage of liquid from the container having the entering portion 2 fitted or received through an opening or hole therein.

The tubular member or portion 1 has a coil spring attaching member 7 fitted externally thereon adjacent to the cutting or entering portion 2, and this attaching spring member is connected at one end with the tubular member 1 to be held against rotation, and has its other end extending to be resiliently movable. This movable end serves and functions somewhat after the manner of a pin or bayonet type fastening, and is in effect a spring thread, which will enter through the opening or orifice or hole punched or cut or otherwise formed in the can or container or receptacle D, to resiliently exert force to draw the tubular member or portion 1 toward the interior of the can or container. The tubular member 1 has a laterally extending flange 8 carried externally thereon beyond the inner end of the spring attaching member 7, and a packing washer or gasket 9, of cushion rubber, cork, felt, or other suitable material, such as synthetic oil-resistant rubber-like organic compounds on the market under the trade names of "Duprene" and "Thiokol", is fitted around the spring 7 and is held by the flange 8. As the tubular member 1 is rotated to turn the spring screw 7 to enter the opening in the can or container D, after the manner of a pin or bayonet type of fitting, the packing washer or gasket 9 is tightened down against the outer surface of the can or receptacle or container around the opening, and this packing will serve to confine the main portion of liquid to flow from the container D through the hollow cutting portion 2 and the tubular member 1, when the can or container is tilted.

The above structure has been heretofore suggested for use as a spout for liquid containers, but I have found that the tubular member or portion 1 cannot be made sufficiently long for convenient pouring without presenting manufacturing difficulties, that a flexible pouring spout is desirable, and that the parts as above described are not conveniently and readily handled and manipulated for attachment to and detachment from a can or container. My invention overcomes the above difficulties and includes additional features and advantages in both the manufacture and the use of my improved structure.

A flexible spout or nozzle 10, of rubber or other suitable material, such as any of the well-known synthetic rubber-like organic compounds, is conveniently mounted externally on the tubular member or portion 1, and the central opening 11 of this nozzle or spout 10 aligns with the opening of the tubular member 1 to form a continuous liquid pouring passage, when the cutting portion 2 is entered and is detachably connected in a can, after the manner shown in Figs. 1 and 4. Obviously, this flexible pouring spout portion 10 can be of various materials and can be connected or associated with the other parts of the structure in any desired and approved manner. The nozzle or spout portion 10 can be extended to any desired length.

The cup C has a mounting portion 12 fitted around the tubular member or portion 1, and the cup flange 13 extends substantially laterally and concentrically around the inner end of the cutting portion 2, with its concave side 14 faced toward this cutting portion. This cup portion is made of rubber, or of other suitable preferably yielding or resilient and packing material, and the edge 15 is disposed in a plane in front of or below the face of the packing washer or gasket

9. As shown in Fig. 4, when the device of my invention is fitted and is detachably held and connected in position for use, the edge 15 of the flange 13 is brought into contact with the face of the can or receptacle or container D around the opening as cut or otherwise formed therein, and the packing cup portion C is drawn tightly against the surface of the can or container when the spring screw portion 7 is engaged in the opening. In this position and relation, the cup portion C serves somewhat after the manner of a vacuum or suction cup to seal around the opening and positively prevent spilling or leakage of any liquid. Should any liquid find its way into the concave opening 14 of the cup C, the yielding or resilient contact of the edge 15 of this cup C with the can or container will serve to preclude the possibility of dripping or leaking, and when the can is again returned to the upright position as shown in Fig. 4, any liquid within the concave cup opening 14 will drain back into the receptacle. In the present instance I have shown the portions A and C as being made as a single continuous unitary structure, and of the same material, and yet it will be apparent that these portions can be made as separate and distinct parts, and can be of the same or of different materials, as may be found desirable and expedient in the particular use to which the device is to be put.

A comparison of Figs. 3 and 4 illustrates the slight change which takes place in the shape and position of the cup-like member C between its inoperative and operative dispositions. It will be observed that when firmly engaged with the tin can or the like this member becomes deflected axially rearwardly on the generally tubular metallic member 1 and also spreads radially outwardly to a shape of somewhat increased diameter. The generally equivalent cup in each of the several modifications may be constructed to undergo like changes in shape and position in use.

Intermediate the attaching portion 12 and the nozzle portion 10 I have shown the material as peripherally corrugated or grooved, as at 16, to thus provide a roughened portion that can be conveniently grasped and held in the hand, to serve as a handle or grip portion when the device is being attached for use and is being detached.

The handle portion 16 is found particularly advantageous and useful in holding and manipulating the device when using the cutting portion 2. While I have included the cutting portion and have set forth the remaining parts in conjunction therewith, conceivably, instances may arise where the cutting portion may not be used, and then means sufficient to detachably connect the spout at an opening in a container, as for example the means at B, will prove sufficient.

In the modified disclosure in Figs. 6 and 7, a cutting portion 17 has a piercing point 18 and a cutting edge 19, and an opening is provided at 20 to insure complete and proper flow of liquid to the interior of the cutting portion 17, which will of course be aligned with the opening 11 of the nozzle or pouring spout portion 10. A cup 21, similar to the packing cup C is provided around the cutting portion 17, and a packing gasket 22 can be employed, or can be omitted. The cutting portion 17 has external screw threads 23 formed around the inner portion thereof, and extending inwardly beyond a plane including the face edge of the packing cup 21. The pouring nozzle or spout, similar to the spout portion A will be provided.

In the use of the above modified construction, the cutting portion 17 can be employed to penetrate the top of a tin can or other sheet metal or sheet material container or receptacle, and then by rotating the device to turn the thread 23 into the opening of the container, the pouring spout will be detachably connected at the opening, and at the same time the cup portion 21 will be drawn down to bear yieldingly or resiliently against the container around the opening, to thus prevent spilling or dripping or leakage of liquid. As stated, the packing washer or gasket 22 can be use if desired, or in some instances it may be found desirable to dispense with the use of this packing washer or gasket and to rely entirely upon the packing or suction cup portion 21 to confine and retain the liquid.

In Figs. 8 and 9 I have illustrated cross sectional views of modified constructions which can be employed in the pouring opening or passage 11 of the nozzle 10 of the spout portion A, and as disclosed in Fig. 8, the inner wall of the passage 11, throughout its entirety or for only a short length, has the longitudinally formed undulating configuration which in substance includes ribs 24 and intermediate grooves 25. In Fig. 9 I have shown the use of one or more ribs 26, extending longitudinally within the passage, and by this construction and formation the liquid flowing through the passage 11 of the nozzle or spout portion is directed and is guided in a manner to prevent splashing.

Where alcohol, methanol, and other readily volatile liquids are supplied in sealed cans, there is little likelihood of loss through evaporation, while the can or receptacle remains closed; but, heretofore when a sealed can has been opened, no practicable way has been found to prevent loss through evaporation and the escape of odors which often prove noxious or objectionable. With my improved structure, the pouring spout structure can be connected at the opening in the can or other container or receptacle, and can be left connected until the entire contents has been drained or used. Where the pouring spout is left in place, in this manner, it is desirable that means be provided to close the end of the passage 11, and in Figs. 10 and 11 I have illustrated a stopper structure conveniently carried and associated with the pouring spout in position and relation to be used to close the opening 11. As here shown, the nozzle portion 10 has on one side thereof an attaching ear or perforated tab portion 27, and a stopper or plug 28 formed and adapted to be fitted in and to close the open discharge end of the passage 11 has a similar attaching ear or perforated tab portion 29. A loop or bail member 30, of wire or other suitable material, as passed through the openings of the tabs 27 and 29, and in this way the plug or stopper 28 is held captive in association with the pouring spout structure A, and in a relation to permit free and ready insertion to close the passage 11, and removal to open this passage preparatory for pouring liquid therethrough and therefrom.

With the modified structure shown in Fig. 12, the edge or face 15 of the cup C is provided with a plurality of openings or concave recesses 31, which when the face or edge 15 is brought against the top of the can or container will serve and function as individual suction cups and thus give

a better gripping and holding action to cause the rim 15 to adhere more firmly to the sheet metal surface. Obviously, the shape and size and number of the openings or recesses 31 provided circumferentially around the edge 15 can be varied to suit different and particular requirements of use.

With the modified construction illustrated in Fig. 13, the cup flange 13' is made up with the outer portion thereof formed or constructed as or in a plurality of plies or laminations, as at 32, so that as the edge 15' is pressed against a can or container top, the action is in effect as a plurality of suction cups or rings, thus insuring a firm adherence to and rigid holding of the spout upon the surface of the can or container. If desired, the several plies or laminations might be made of rubber or other material having different consistency, so that the action of the several cups would thus be varied, and in some instances it may be found desirable to make the outer portion of a different consistency of rubber, or to provide reinforcing or otherwise construct this outer lamination to have greater rigidity so that in use this outer lamination will tend to exert force away from the can or container top to thus aid in the securement and adherence of the suction cups formed by the inner laminations.

With the modified construction shown in Fig. 14. the pouring spout A' is made substantially as hereinbefore described, and the flexible nozzle or spout portion 10' is extended and is flexible so that it can be bent to any desired curve for more ready manipulation and pouring. The securing means B is of the form and construction hereinbefore described, and this means is assembled with the spout A' as set forth above. However, in this disclosure the cup portion C is omitted and the packing washer or gasket 9 is relied upon to establish a liquid tight connection around the opening through the top of the can or container. In some instances, the extending flange 8 and the packing washer or gasket 9 can be dispensed with, and reliance could be had upon the lower end of the pouring spout A', to serve as a packing to seal around the opening in the can or container. With this form and construction, the flexible pouring spout is held in communication with the liquid discharge opening by the opening forming and the securing means, as set forth above, and the flexible spout or nozzle 10 can be bent or extended at any angle or curve that may be desired for most convenient use.

From the foregoing it will be seen that I have provided a simple and inexpensive liquid pouring spout and can opener structure which can be used with facility in connection with a can or other liquid container or receptacle to pour liquid in a directed limited flow and course, and to assure positive protection from leaking or spilling. Although I have primarily described and indicated this device as constructed and used in connection with anti-freeze solutions, it is obvious that the device is capable of use for many other purposes, as for dispensing oils and other lubricants, for pouring and dispensing beverages, and in fact substantially any and all liquids from cans or other containers or receptacles capable of being tilted to permit pouring of liquid contents therefrom. Where the liquid being poured and handled might cause deterioration of a rubber spout A, a metal lined, or other flexible pouring spout structure can be employed.

The term "rubber" as used in the appended claims is intended to comprehend all equivalent materials which are sometimes used in place of rubber, as for instance the synthetic rubber-like organic compounds well known in the arts and marketed under various trade names, such as "Duprene" and "Thiokol", which are commonly substituted for rubber for their greater resistance to the action of oils and greases as well as for other properties, in uses where oil-resistance or the other properties are desirable.

While I have herein shown and described only certain specific embodiments of my invention and have set forth only certain possible variations in the construction and the materials, and in the use and adaptation, it will be appreciated that many changes and variations can be made in the form, construction, arrangement and assembly of the parts, in the manner of use, and in the materials employed, without departing from the spirit and scope of my invention.

I claim:

1. A can-opening pour-spout including a generally tubular elongated metallic member open at both ends and having one end thereof shaped to pierce and to form a hole in the end-wall of a tin can or the like, a generally coaxial fluid-sealing gasket surrounding said metallic tube in relatively close proximity thereto and held thereto against the total axial displacement and in generally fluid-sealed relation at a zone generally adjacent said can-piercing end of said generally tubular metallic member, said fluid-sealing gasket being adapted to be held against the flat end-wall of a tin can or the like at a zone generally adjacent the hole pierced therein by the adjacent can-piercing end of said generally tubular metallic member, an axially-deflectable yieldable cup-like member of rubber surrounding said generally tubular metallic member in generally fluid-sealed relation thereto and having an annular can-engaging portion of a diameter substantially larger than the diameter of the aforementioned gasket, whose normal position is substantially in advance of the can-engaging surface of said gasket when the pour spout device is not in use and which is adapted to engage the end-wall of the tin can in advance of said gasket and to be deflected rearwardly thereby until said gasket is brought into contact with the end-wall of the tin can, and a flexible and generally form-retaining rubber pour-spout surrounding the other end of said generally tubular metallic member generally in continuation of said cup-like member and connected with said generally tubular metallic member in fluid-sealed relation and extending substantially therebeyond.

2. A can-opening pour-spout including a generally tubular elongated metallic member open at both ends and having one end thereof shaped to pierce and to form a generally round hole in the generally flat end-wall of a tin can or the like, screw-like wedging means associated with the can-piercing end of said generally tubular metallic member for wedgingly engaging the periphery of the pierced hole in the tin can by rotary motion of the whole pour-spout device about its longitudinal axis, a generally coaxial fluid-sealing rubber gasket surrounding said generally tubular metallic member in relatively close proximity thereto and held thereto against total axial displacement and in generally fluid-sealed

relation at a zone in operative relation to said screw-like wedging means, said fluid-sealing gasket being adapted to be held against the flat end-wall of the tin can at a zone generally adjacent the hole pierced therein by the adjacent can-piercing end of the generally tubular metallic member, an axially deflectable yieldable cup-like member of rubber surrounding said generally tubular metallic member in generally fluid-sealed relation thereto and having an annular can-engaging portion of a diameter substantially larger than the diameter of the aforementioned gasket, whose normal position is substantially in advance of the can-engaging surface of said gasket when the pour-spout device is not in use and which is adapted to engage the end-wall of the tin can in advance of said gasket and to be deflected rearwardly thereby until said gasket is brought into contact with the end-wall of the tin can, and a resilient and generally form-retaining rubber pour-spout surrounding the other end of said generally tubular metallic member generally in continuation of said cup-like member and connected with said generally tubular metallic member in fluid-sealed relation and extending substantially therebeyond.

3. A can-opening pour-spout including a generally elongated metallic tubular member open at both ends and having one end thereof shaped to pierce and to form a hole in the end wall of a tin can or the like, a generally coaxial fluid-sealing gasket surrounding said metallic tube in relatively close proximity thereto and held thereto against total axial displacement and in generally fluid sealed relation, at a zone generally adjacent said can-piercing end of said metallic tube and spaced substantially from the opposed rear end of said metallic tube, and a generally form-retaining and non-collapsing tubular rubber pour-spout having one end zone thereof telescoped over the major rear portion of said metallic tube rearwardly of said gasket and constituting an enlarged handle for manually gripping said metallic tube and having a major portion thereof projecting beyond said metallic tube.

4. A can-opening pour-spout device including a generally tubular metallic member open at both ends and having means at one end thereof for piercing and for forming a hole in a wall of a tin can or the like, in combination with a rubber member having an axially-deflectable yieldable cup-like portion surrounding said generally tubular metallic member in fluid-sealed relation thereto in a zone generally adjacent the can-piercing end thereof and having an annular can-engaging edge of a diameter substantially larger than the effective diameter of the aforesaid can-piercing means, and whose normal position is substantially in advance of the point of maximum can-penetration of the can-piercing end of said generally tubular metallic member when the pour spout device is not in use, and which is adapted to engage the wall of the tin can and to be deflected rearwardly thereby and to spread radially outwardly to increase its diameter as the can-piercing end of the generally tubular metallic member penetrates further into the tin can, and a flexible spout or nozzle portion generally continuous with the cup-like portion of the rubber member and extending from the opposite end of the metallic member.

5. A can-opening pour-spout including a generally tubular metallic member open at both ends and having means at one end thereof for piercing and for forming a hole in a wall of a tin can or the like, an axially-deflectable yieldable cup-like member of rubber surrounding said generally tubular metallic member in fluid-sealed relation thereto in a zone generally adjacent the can-piercing end thereof and having an annular can-engaging portion of a diameter substantially larger than the effective diameter of the aforesaid can-piercing means, and whose normal position is substantially in advance of the point of maximum can-penetration of the can-piercing end of said generally tubular metallic member when the pour spout device is not in use, and which is adapted to engage the wall of the tin can and to be deflected rearwardly thereby and to spread radially outwardly to increase its diameter as the can-piercing end of the generally tubular metallic member penetrates further into the tin can, and a generally coaxial fluid-sealing gasket surrounding said generally tubular metallic member in generally fluid-sealed relation thereto and having a diameter less than the outer diameter of said cup-like member and having its effective position generally rearwardly of the peripheral plane of said cup-like member in its inoperative position.

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