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MARKING DEVICES

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FIG. 1

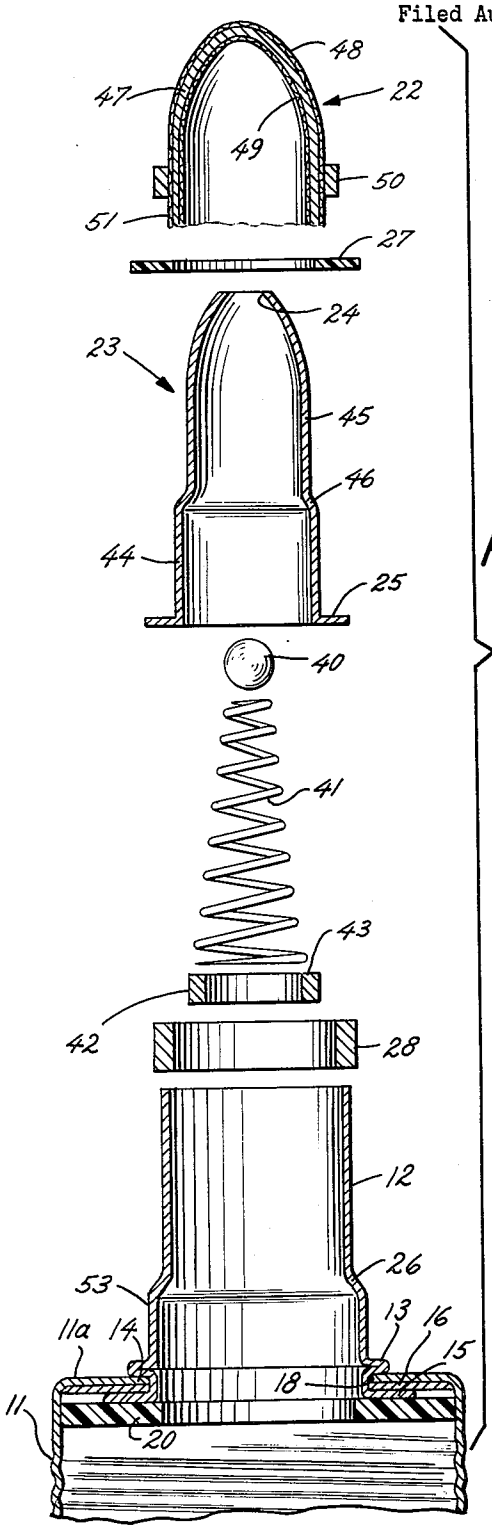
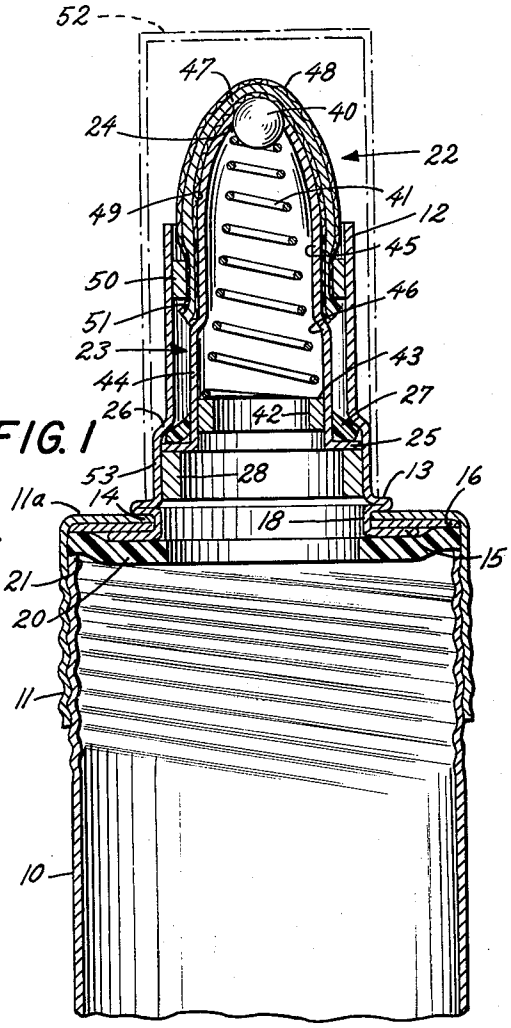


FIG. 2



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MARKING DEVICES

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The present invention relates to marking devices of the type wherein a marking fluid is supplied to an absorbent and porous applicator from a supply carried free in a fluid and vapor confining container or reservoir.

An object of the invention has been to provide a marking device capable especially of more effective use in applying an opaque rapidly drying marking fluid or ink to relatively clean porous or non-porous surfaces as those of glass, wood, paper or the like.

Further objects have been to provide at commercially favorable cost such a device which is sufficiently rugged in form and material to endure hard and long use; and to provide a marker which will remain unimpaired over long periods of time both in storage prior to use and when standing idle after use.

Factors contributing to the attainment of these objects and others in embodiments of the invention include the selection and use of appropriate materials and structural features which provide optimum resistance to leakage of liquid and vapor. Thus, where an opaque pigment based, as distinguished from translucent or dye based, ink is to be employed, it is generally more viscous than the translucent type and so requires feeding and applicator means by which the opaque ink will reach the surface to be marked in proper supply and with appropriate freeness. Also, where the solvent or medium in which the opaque pigment is suspended is highly volatile to insure rapid drying, means are provided for closely confining both fluid and vapor in the device and thereby to insure against depletion or impairment of the ink supply by leakage due to faulty construction of the device.

In general, an embodiment of my present invention includes an ink holding container open at one end, a cap releasably secured to said container and having an end wall extending across the open end thereof, said end wall being provided with an opening to receive ink feeding means including a tube or spout with its inner end mounted coaxially in said opening and in communication with the interior of said container. Said spout has a discharge opening at its outer end and carries a valve, preferably a ball, spring biased to close said discharge opening. A housing also arranged with its inner end mounted coaxially in said opening of the cap embraces said spout for a substantial portion of its length, the internal surface of said housing being spaced from the opposed external co-extending surface of the spout, and with the open end of the spout extending beyond the open end of the housing. An applicator which is in effect a hollow flexible shell or pad of suitably porous and absorbent materials is arranged with its outer end of rounded contour engaging and extending across the outer end portion of said spout and across a portion of said ball valve which normally protrudes through and beyond said end opening in the spout, the peripheral or skirt portion of said applicator being snugly engaged between the opposed walls of said housing and said spout. Said parts are so arranged and proportioned that when the user presses the outer end of the applicator pad inwardly, the composite of flexible absorbent and porous materials is compressed and bears against the outwardly exposed surface of the ball valve which is thereby unseated to allow a desired amount of ink to flow from the interior of the spout into the applicator pad; and this ink is transferred from the applicator to the surface to be marked by drawing the pad across such surface with normal writing pressure to release therefrom the proper amount of absorbed ink.

One embodiment of the present invention is shown in the drawings accompanying this specificaiton and wherein

FIGURE 1 is an exploded view on exaggerated scale partly in transverse longitudinal section showing the parts constituting said embodiment in their condition prior to final assembly; and

FIGURE 2 is a view in central longitudinal section showing said parts assembled to form said embodiment.

Referring to the drawings, the marking device there shown includes a container **10** for a supply of ink (not shown) carried therein in free flowing condition. Where the marker is to be employed primarily in applying opaque markings to generally smooth clean porous or non-porous surfaces, the ink is conveniently a mixture of a pigment in a volatile fast drying medium with a viscosity factor appropriate to produce the desired results.

The open end (upper as shown) of container **10** is closed by a screw threaded cap **11** and an applicator assembly mounted thereon. For this purpose cap **11** has a central opening coaxial with the open end of container **10**. A tubular housing **12** preferably of readily workable metal, as aluminum, is formed with longitudinally spaced annular flanges **13** and **15** which provide a peripheral channel **18** adapted to embrace edge portion or lip **14** of cap **11** which defines the central opening in the end wall **11***a* thereof.

A gasket **16** of, or including, leak resistant sheet material, as a suitable plastic, is embraced securely between said end wall **11***a* and the inner flange **15** of said housing **12** to provide a leak resisting joint between said cap and said housing.

Housing **12** is thus retained in operative substantially leak-proof condition on cap **11** by said flanges **13** and **15** when said edge portion **14** which defines the central opening in the end wall of cap **11** is engaged in said recess **18** and clamped securely therein between said flanges. To render the joint thus formed more effectively leak-proof the inner annular portion of said gasket **16** is also clamped between said flanges; and an outer or peripheral edge portion of said gasket extends radially beyond said recess or channel **18** and closely engages underside and inner lateral surface portions of cap **11**. When the parts are assembled, as in FIGURE 2, with cap **11** screwed down on container **10**, a gasket **20**, preferably of impervious and corrosion resistant material, as a suitable plastic, is engaged by edge **21** of the container **10** and pressed into sealing contact with peripheral edge portions of gasket **16**. Thus, provision is made for tightly sealing the joint between container **10** and removable cap **11** as well as for tightly and permanently sealing the joint between cap **11** and the housing **12**.

In use, ink is supplied from container **10** to an applicator **22** through a tube or spout **23** slightly tapered toward its outer end and advantageously of stainless steel, and provided with a valve controlled discharge opening **24** at said outer end and a flange **25** at its inner end.

As seen in FIGURE 2, spout **23** is securely mounted in the bore of housing **12**. For this purpose said housing is formed with a peripheral shoulder **26**. A gasket **27** of impervious material, as plastic, is interposed between said flange **25** and said shoulder **26**. A bushing or ring **28** is press fitted through the open inner end of housing **12** into the position shown in FIGURE 2, or such as to clamp flange **25** and gasket **27** tightly against shoulder **26** and thereby substantially prevent leakage of fluid across the joint between housing **12** and spout **23**.

Said spout **23** is provided with a valve, as a stainless steel ball **40** which is normally pressed into sealing engagement with the defining edge of discharge opening

24 by a spring 41, also preferably of stainless steel, or equivalent corrosion resistant material. A suitable ring or bushing 42 firmly mounted in or pressed into the inner end of spout 23 provides a shoulder 43 so positioned that when spring 41 is assembled with its outer narrowed end bearing against ball 40, the opposite or inner wider end bears against shoulder 43 to retain said spring securely in operative biasing relation to said ball 40.

Spout 23 also includes a slightly tapered base portion 44, a slightly tapered end portion 45 of reduced cross sectional area as compared to said base portion and having a rounded terminal end, and an annular shoulder 46. Said parts of spout 23 are of such dimensions that when mounted, as seen in FIGURE 2, the exterior lateral surface of spout 23 is spaced from the opposed interiorly exposed surface of housing 12 in part to accommodate portions of applicator 22.

Said applicator 22, in a form appropriate for use in marking relatively smooth clean porous surfaces or relatively non-porous surfaces, such as glass, is, in effect, a composite flexible pad including an inner layer or core 47 of absorbent porous material such as relatively soft or loosely constituted felt which is enclosed between an outer layer 48 and an inner layer 49 of suitably porous and preferably relatively non absorbent mesh fabric, such for example as a woven nylon, or the like. Said core 47 and said layers in assembled relation are conveniently shaped into the form of a desirably hollowed and rounded applicator pad by drawing their overlapping peripheral edge portions down over the outer end portion 45 of said spout 23. A ring 50 is applied to embrace the skirt or depending portion 51 of the pad 22 to retain the latter in assembled condition with its rounded outer end adapted to extend across the rounded outer end of the spout 23 and the discharge opening 24 therein. To complete the assembly of the marker, applicator 22 with its skirt portion embracing said narrow outer end portion 45 of spout 23, is pressed inwardly to its operative position substantially as seen in FIGURE 2. In this arrangement, ring 50 and skirt 51 are positioned snugly between housing 12 and spout 23 and with the inner edge of said skirt bearing against and stopped by said shoulder 46. The outer rounded or marking portion of applicator pad 22 is positioned so that ball 40 may be readily displaced against resistance of spring 41 by pressure applied through the flexible pad 22.

To minimize or delay evaporation of the volatile medium from ink absorbed in applicator 22, a cap 52 is provided which fits closely around the base portion 53 of housing 12.

In operation, cap 52 is removed and the marker is held in a position which permits ink to flow from the container into the spout toward discharge opening 24. The rounded end of applicator 22 is urged downwardly against the surface to be marked with sufficient pressure transmitted through the pad to unseat ball 40 and thereby release ink through opening 24 into the interior of the applicator. Where a nylon or like fabric forms

the inner layer 49, its porosity affords easy passage of ink into the absorbent core 47; and likewise, a nylon outer layer 48 permits free flow of ink from the core onto a surface to be marked. A composite pad or applicator, as described, provides adequate ink absorption and distribution without undue clogging of the opening 24 by loose fibers, such as can occur if a loosely constituted felt is in direct contact with valve ball 40. Also, where the outer fabric layer is formed with hard or compact thread, the marks produced thereby on glass surfaces, or the like, are sharply defined and not likely to be blurred by ink deposited from loose fibers or fiber ends.

What I claim is:

1. A marking device comprising an ink container having a threaded open end portion, a screw cap releasably engaging said threaded end and having an end wall provided with a central opening, a tubular housing open at its free outer end and mounted with an inner end portion engaged in said opening in the end wall of the cap, a tubular spout coaxially arranged in the housing and having an annular shoulder formed between an inner end portion which is of relatively greater diameter and an outer end portion which is of relatively reduced diameter and has a rounded converging tip extending through and outwardly beyond the outer end of said housing, said spout having a valve controlled ink feeding opening through its rounded tip end, and a flexible porous applicator having a marking portion extending across said ink feeding opening and said valve and having skirt portions embracing said outer reduced end portion of the spout, a retaining ring encircling said skirt and slidably engaging opposed inner surface portions of said housing, and being arranged and adapted to releasably retain the inner annular edge portion of said skirt opposite said shoulder of the spout.

2. A marking device according to claim 1 and wherein a ball valve extends outwardly through said valve opening toward the under side of said marking portion of the applicator.

3. Means according to claim 1 wherein the applicator is thimble shaped with its skirt portion tightly fitting in the annular space between the spout and the housing.

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