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MEANS FOR SEALING A WICK TYPE MARKING DEVICE

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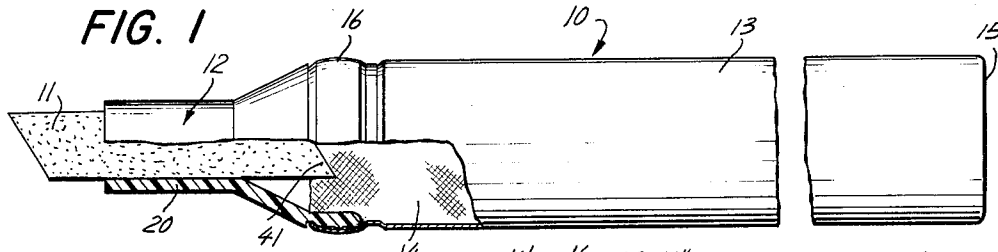
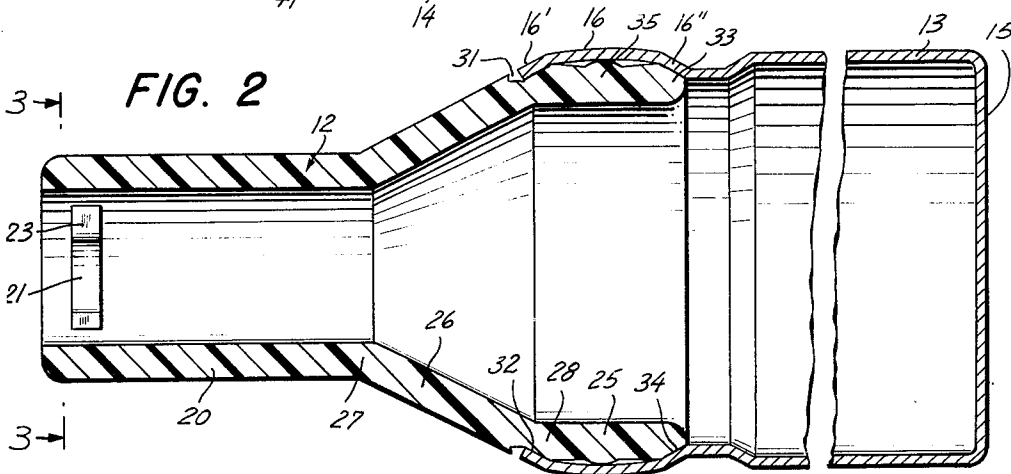
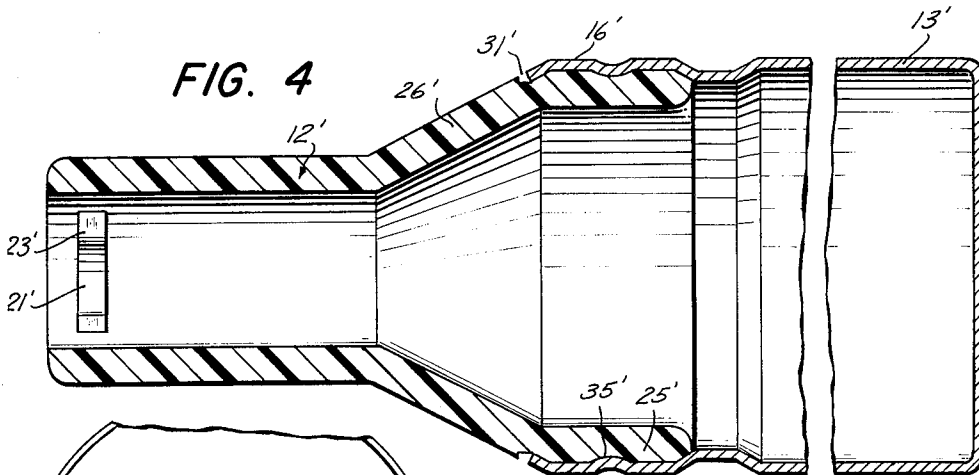
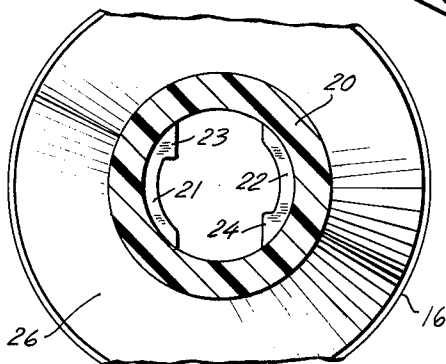


FIG. 3

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MEANS FOR SEALING A WICK TYPE MARKING DEVICE

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This invention relates to the art of marking devices, more particularly to an improved construction for a marking device of the type having a marking nib supported in fluid transmitting relationship with respect to a marking fluid container.

As conducive to an understanding of the invention, it will be seen that a variety of different types of marking devices have been evolved in which a marking nib of felt, or the like fluid transmitting material is arranged in conjunction with a fluid reservoir so that the marking fluid contained in an absorbent core in the reservoir will flow through the nib. In producing marking devices of this type, it is necessary to support the nib in a relatively secure position in conjunction with the container forming the marking fluid reservoir so that there will be no leakage of the fluid from the marking device. The reservoir is generally formed of a conventional container member fabricated of plastic, metal, or any other suitable material adapted to form a fluid-tight reservoir. Thereafter the nib is arranged with respect to a supporting structure which is conjoined with the reservoir, either by being formed integrally therewith by a die forming operation or by means of a screw thread between the nib supporting structure and the reservoir which serves to effect a fluid-tight seal. In order to insure the fluid tightness of the screw thread, prior art structures have generally employed auxiliary sealing elements.

The formation of a fluid-tight seal by the above method involves numerous production steps which serve to increase the cost of the marking device.

It is accordingly among the objects of this invention to provide an improved marking device in which the nib supporting structure may be arranged in fluid-tight relationship with respect to the marking fluid container in a simple, efficient manner at relatively low cost.

A further object of the invention is to eliminate the need for a threaded surface between a nib supporting structure and the fluid containing reservoir of a marking device.

Another object of the invention is to provide a marking device construction permitting the attachment of different types of nib supports with respect to a single type of fluid containing reservoir thereby permitting a single type of fluid containing reservoir to be used with a variety of different types of marking nibs.

It is also an object of the invention to provide a marking device in which a marking nib support may be employed which may be color coated to indicate the characteristics of the marking fluid applied by the device.

According to the invention, the marking device is formed by fabricating a marking fluid container with a mouth portion or skirt subject to being deformed as by swaging or crimping. The nib supporting means comprises a hollow member of rigid material having a nose piece and a body portion, the marking nib being secured at the outer end of the nose piece and extending into the body portion. The body portion which is substantially cylindrical and of larger diameter than the nose piece and joined to the latter by an integral frusto-conical portion is provided with an external annular recess at its root end and an annular sealing region is formed on the exterior wall thereof. In assembled relationship, the skirt of the marking fluid container is arranged over the body por-

tion of the nib support and the rim of such skirt is swaged into the annular recess mechanically to secure the container to the nib support. It is preferred that the region of the skirt of the container immediately adjacent the rim of the mouth of the body portion of the nib support also be swaged inwardly against such rim. A seal is effected between the container and the nose piece by reason of the contact of the interior surface of said skirt and the annular sealing region of said nib support body portion to prevent leakage of fluid between the interior of the skirt and the exterior of the body portion.

A feature of the invention resides in the formation of the annular recess within which the skirt is swaged in the region of the frusto-conical portion of the nib support so that the free, relatively sharp edge of the rim of the skirt will be flush with the frusto-conical portion to provide a smooth surface.

In the accompanying drawings in which are shown one or more of various embodiments of the several features of the invention,

FIG. 1 is a longitudinal view partly in section of a marking device made according to one embodiment of the invention,

FIG. 2 is an enlarged longitudinal sectional view with parts broken away of the embodiment of the invention illustrated in FIG. 1,

FIG. 3 is a cross sectional view taken on line 3—3 of FIG. 2 illustrating how the nib is supported with respect to the nib supporting nose piece,

FIG. 4 is a view similar to FIG. 2 showing another embodiment of the invention,

Referring now to the drawings, as shown in FIGS. 1 to 3, the marking device 10 is of a four-piece construction with a nib 11, a nib support 12, a marking fluid reservoir formed by a container 13 and an absorbent core 14 in said container 13.

The reservoir 13, as illustrated, is of a cylindrical configuration and is preferably formed by conventional metal working techniques, of aluminum, or any other suitable lightweight metal subject to being formed into a rigid relatively thin wall fluid-tight container. The bottom 15 of the container 13 is integral with the body thereof as shown in FIG. 1 and the open end or mouth of the container 15 defines a skirt 16.

The nib support 12 is preferably molded from non-metallic material such as rubber, plastic, fiber, compressed wood, glass fiber, or the like resulting in a rigid structure. The nib support 12 has a cylindrical hollow nose piece 20 with nib retaining flanges 21 and 22 on the interior of the outer end thereof, as best seen in FIG. 3, each having a locking projection 23 and 24 respectively which will engage the nib 11 when it is inserted into the hollow interior of nose piece 20 and turned therein. The nib support 12 has a hollow cylindrical body portion 25 of larger diameter than the nose piece 20 and integrally connected thereto by a frusto-conical portion 26 extending from the root end 27 of the nose piece 20 to the root end 28 of the body portion 25. The body portion is formed with an annular recess 31 preferably positioned at the root end of the body portion 25, the rear wall 32 of the recess 31 being beveled at an angle substantially equal to that of the frusto-conical portion 26. The rim 33 of the mouth of body portion 25 is beveled on its outer surface as at 34 and sealing means 35 in the form of an external annular rib is provided on the body portion between recess 31 and rim 33.

To assemble the device, after the absorbent core 14 has been positioned in the container, the skirt 16 of the container which is of internal diameter just slightly larger than that of the body portion 25 of the nib support 12, is fitted over the latter and the free edge 16' of the rim of the skirt 16 is swaged into the annular recess 31 and the portion 16'' of the skirt 16 aligned with beveled portion

34 is swaged against the latter, serving to force the intermediate portion of skirt 16 against sealing rib 35 to provide secure mechanical engagement between the container 13 and the nib support 12 and serving also to provide a fluid tight seal between the container 13 and the nib support 12.

As the beveled portion 32 of recess 31 is inclined at substantially the same angle as that of the frusto-conical portion 26 of the nib support, the free edge of the rim of skirt 16 will be flush with such frusto-conical portion, thereby providing a smooth surface.

The embodiment of the invention shown in FIG. 4 is identical to that shown in FIGS. 1 to 3, except for the sealing means and corresponding parts have the same reference numerals. In the embodiment of FIG. 4, in place of the annular sealing rib 35 an annular groove 35' has been employed and in assembling the construction shown in FIG. 4 a separate swaging operation is employed to effect desired contact between the inner surface of the skirt 16' and the groove 35'.

After the marking device is assembled, as above described, the absorbent core is charged with ink of desired color and then nib 11 is positioned in the nose piece 20 with the inner end 41 thereof against the adjacent end of the core and the nib is rotated to be locked in position by projections 23, 24.

By reason of the unique construction above described, the marking device may be fabricated at relatively low cost with few simple operations with assurance that a dependable fluid type seal will be provided between the nib support and the fluid container.

As the nib support is a separate and distinct element and is readily moldable to a wide variety of sizes and shapes with one size of container, any one of a large selection of nib supports can be used so that nibs of different sizes can be employed, thereby eliminating the need for stocking of a large quantity of containers, each with a nib of a fixed size associated therewith.

As many changes could be made in the above constructions and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a marking device having a container in which a marking fluid is retained and a marking nib in communication with the marking fluid, means for supporting the marking nib in operative fluid transmitting relationship with respect to the container, said nib supporting means comprising a hollow nose piece in which said nib is supported, a hollow body portion associated with said nose piece and integrally connected thereto, said body portion having an annular recess and an annular sealing portion formed on the exterior wall thereof, and a rearwardly beveled surface at the free end thereof, said container having a mouth at one end defining a skirt, the free end of said skirt being adapted to be moved into said annular recess on said body portion; the portion of said skirt spaced from said free end being adapted to be forced against said beveled portion, and the inner surface of said skirt between the free end of said skirt and said portion of said skirt, being movable against said sealing portion to effect a fluid tight connection between said nib support and said container.

2. A marking implement as in claim 1 in which said annular sealing portion comprises an annular rib extending about said body portion.

3. A marking implement as in claim 1 in which said annular sealing portion comprises an annular groove extending about said body portion.

4. A marking implement as in claim 1 in which said body portion is of larger diameter than said nose piece and a frusto-conical portion joins the root end of the nose piece and the body portion and is integral therewith, said annular recess being positioned at the root end of said body portion, whereby the free end of said skirt of said container will be enclosed to provide a smooth surface for the marking implement.

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