Dec. 2, 1969 C. A. ABRAHAMSON 3,481,677

MARKING DEVICE

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FIG. 1

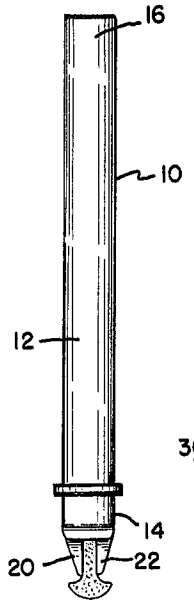


FIG. 6

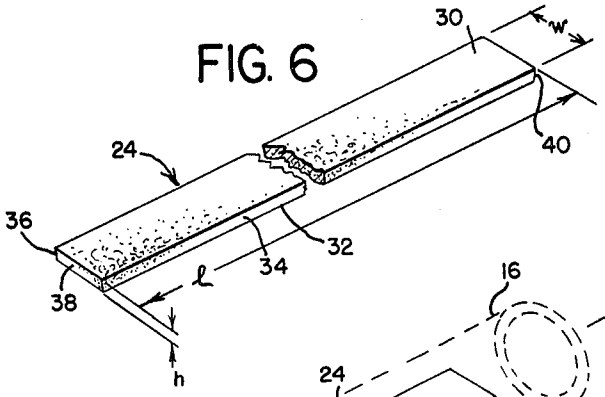


FIG. 2

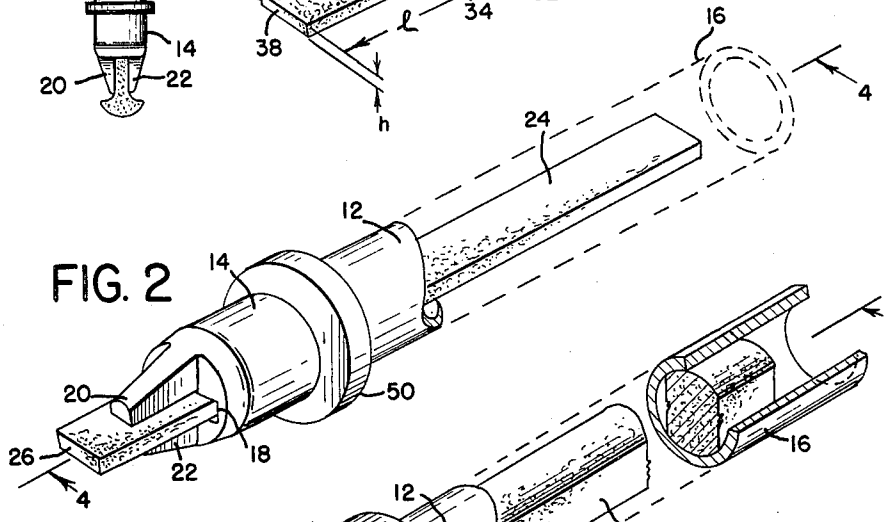


FIG. 3

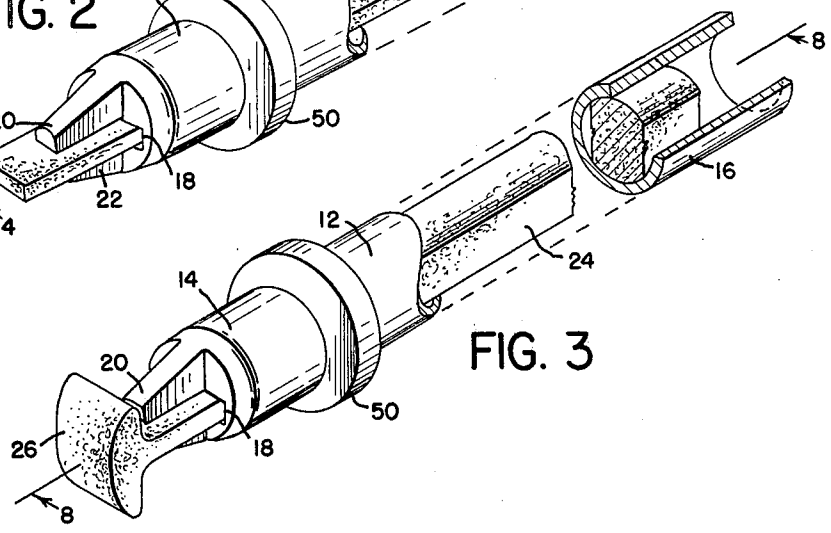
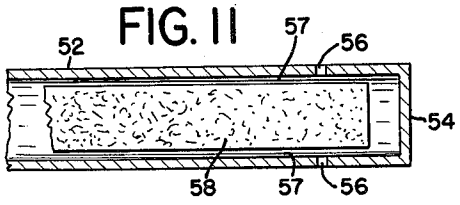


FIG. 11



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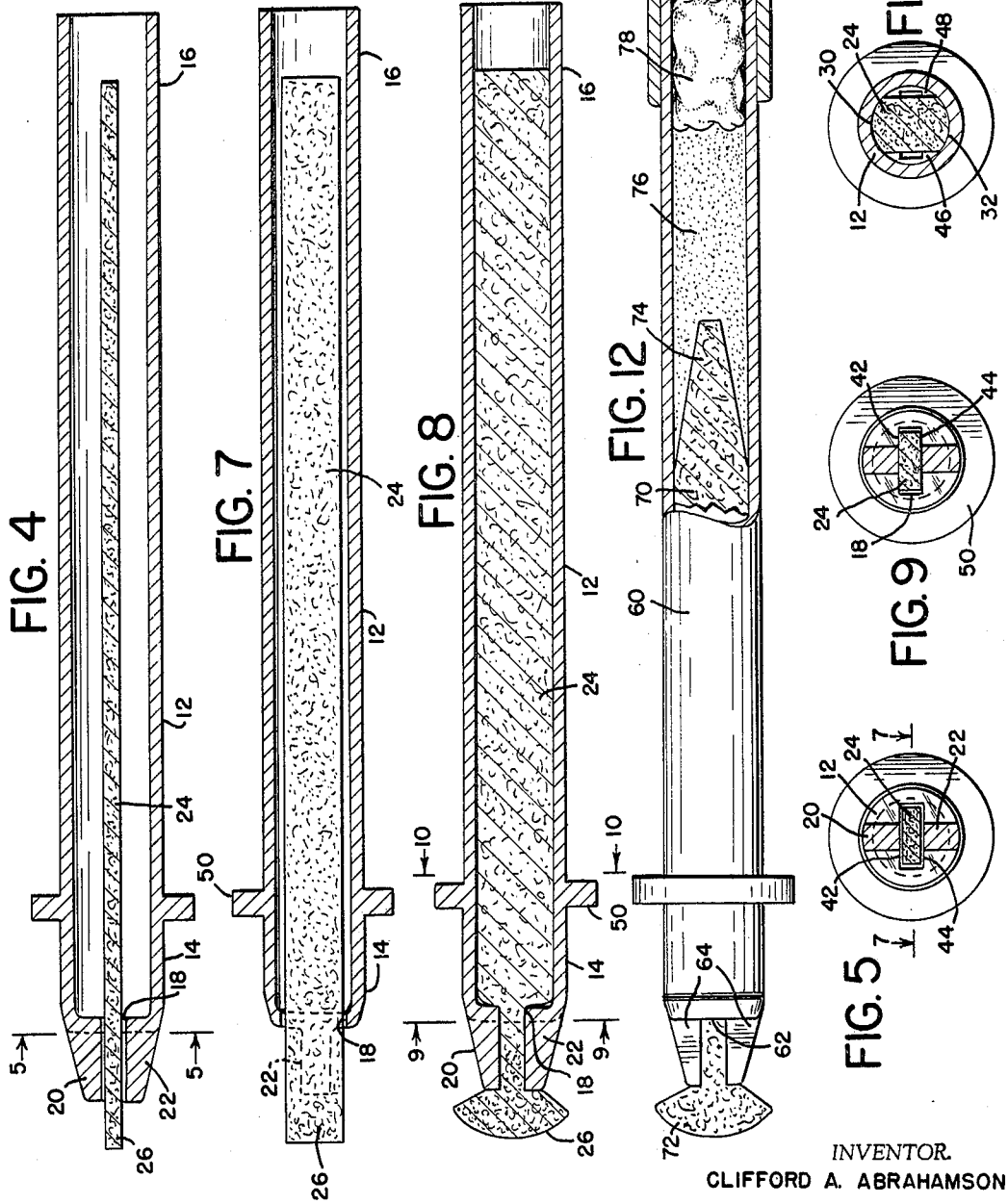
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Dec. 2, 1969 C. A. ABRAHAMSON 3,481,677

MARKING DEVICE

Filed March 1, 1967 2 Sheets-Sheet 2



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3,481,677

MARKING DEVICE

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U.S. Cl. 401—198 8 Claims

ABSTRACT OF THE DISCLOSURE

A marking device which includes a cylindrical barrel having an opening in one end out of which a sponge wick or nib projects, thereby forming a tip. The wick is saturated with a water soluble dye solution. By moistening the tip with water, and pressing it against a surface, the dye will leach out of the wick onto a surface.

The present invention relates to a marking device and more particularly to an improved dye containing device which is usable for marking or coloring purposes.

A variety of marking device, coloring pens, and related implements are known in the art for use as toys or play instruments, as well as for use in the home or at work for multivarious purposes. Ink marking pens with relatively large tips for example, have in recent years, become quite popular for use in instances where a permanent mark of fairly large dimensions is desired. The use of fountain pens, ballpoint pens, or the like, is ofttimes unsatisfactory for marking or coloring purposes, because these devices have a point which produces a mark which is too small or fine for many purposes.

According to the known prior art, marking devices of the type to which the present invention relates, include a barrel out of which a marking tip protrudes; tips of this type are often formed of an absorbent material, such as felt. The tip is maintained in fluid communication with a reservoir containing marking ink, with the marking ink passing by capillary action from the reservoir to the marking tip. A cover is generally provided for covering the tip during periods of non-use. In certain other devices a fluid reservoir is not provided; in lieu thereof, an ink saturated felt wick or packing is provided which fills the barrel. A separate marking tip abuts against the wick and absorbs ink from it, thus providing a marking device.

The known prior art devices have certain disadvantages. The marking fluids often used are quite volatile; therefore it is necessary to cover the tip and reservoir when the device is not in use, in order to prevent evaporation of the fluid. Furthermore, in many instances the marking fluid used is of a permanent type; consequently, the use of such devices by small children as a coloring implement is not always advisable. Another disadvantage of available devices is that they are rather bulky and cumbersome to use because of the necessity of providing a fairly large barrel to accommodate a reservoir of fluid, or a saturated wick; this factor is especially important if the device is to be used by children, because they might find such a device unwieldy and cumbersome to use.

Accordingly, one object of the present invention is to provide a device which can be used for marking or coloring purposes.

Another object is to provide a marking or coloring instrument which is simple in construction, relatively small in size, and which can be used for extended periods of time.

A further object is to provide a dye containing coloring device which is really usable by children as a toy item.

Another object is to provide a wick containing coloring device which can readily be used even after the wick has become dried out or dehydrated.

A still further object is to provide a marking device having a coloring tip which can be readily used after the tip has become dried, due to exposure to the atmosphere, by merely remoistening the tip with water.

Other objects and advantages of the invention will become apparent from a consideration of the following specification and drawings. Before proceeding with a detailed description of the invention however, a brief description of it will be presented.

Briefly, the marking device includes an elongated tubular barrel having an opening in at least one end. An elongated wick or nib, formed of a compressed sponge material, is positioned within the barrel so that one of its ends projects through the opening in a first end of the barrel, thereby forming a tip. The wick is retailed within the barrel so that it does not fall out, or become pushed into the barrel when pressure is exerted against the tip. The wick is saturated with a water soluble dye solution of a desired color so that the entire wick is colored. When saturated with the solution, the sponge wick expands so that it at least partially fills the barrel and the opening in the first end of the barrel. As long as the wick is moist, it remains relatively soft and pliable. If the wick becomes dry or dehydrated, it can readily be made to mark or color by dipping the tip in water, thus moistening or hydrating the wick. By moistening the tip with water, moisture flows into the barrel by capillary action, and the dye leaches out of the wick onto a writing or coloring surface against which the tip is pressed.

The invention will best be understood by reference to the following drawings wherein:

FIGURE 1 is a side elevational view of a marking device constructed according to the invention;

FIG. 2 is a perspective view in partial section of the marking device prior to saturating a sponge wick with a fluid medium;

FIG. 3 is a perspective view in partial section of the marking device after the wick has been saturated with a fluid medium;

FIG. 4 is a sectional view taken along line **4—4** of FIG. 2;

FIG. 5 is a sectional view taken along line **5—5** of FIG. 4;

FIG. 6 is a perspective view illustrating the sponge wick removed from the marking device;

FIG. 7 is a sectional view taken along line **7—7** of FIG. 5;

FIG. 8 is a sectional view taken along line **8—8** of FIG. 3;

FIG. 9 is a sectional view taken along line **9—9** of FIG. 8;

FIG. 10 is a sectional view taken along line **10—10** of FIG. 8;

FIG. 11 is a partial sectional view illustrating another embodiment of the invention; and

FIG. 12 is a sectional view which illustrates another embodiment of the invention.

FIGURE 1 illustrates a marking device designated generally by numeral **10**. The device includes an elongated tubular barrel **12** having first and second ends **14** and **16** respectively. The end **14** is provided with a slit-like opening **18**, and the end **16** is open. A pair of spaced apart projections or nib holders **20** and **22** form an integral part of the barrel end **14**, and they are positioned on the barrel so that they project axially away from the barrel

end. The space between the nib holders **20** and **22** is substantially the same as the thickness of the slit **18**.

An elongated wick or nib **24** is positioned within the barrel **12** in such a manner that its longitudinal axis is parallel to the longitudinal axis of the barrel, and one of its ends projects through the opening **18** in the barrel end, thereby forming a tip **26**. The wick is preferably formed of a compressed cellulose sponge material which is cut into strips of predetermined length and width, and it has a rectangular cross-sectional shape. As illustrated in FIG. 6, the wick has a top surface **30**, a bottom surface **32**, side surfaces **34** and **36**, and ends **38** and **40**. The top and bottom surfaces are somewhat larger than the side surfaces. The sponge material is compressed in any suitable manner, for example during production, so that it will expand in not more than two directions, i.e., opposite directions. As shown in FIG. 6, the sponge is compressed so that its height or thickness h is reduced relative to its initial or expanded thickness. When the sponge material is caused to expand, such expansion occurs in not more than two directions, i.e., the height or thickness h increases, but its length l and width w remain substantially unchanged. While a cellulose sponge material is preferred because it can be readily compressed and expanded, other types of material, such as felt, might be used as well.

As depicted in FIG. 5, the width of the wick **24** is somewhat less than the longest dimension of the slit **18**, and its thickness is somewhat less than the thickness of the slit. Thus, the wick can easily be inserted into the barrel by sliding it through the opening **18**.

After the wick **24** has been positioned within the barrel **12**, it is saturated with a dye solution by dipping the tip **26** into an appropriate dye source. The liquid dye flows toward the opposite end of the wick by absorption and capillary action, and as it does, it causes the compressed sponge material to expand in a direction normal to its width, thereby increasing its relative thickness or height. FIGS. 9 and 10 illustrate the condition of the wick **24** within the opening **18** and the barrel **12** after the sponge material has expanded. The edges **42** and **44** of the slit-like opening **18** grip the wick along its top and bottom surfaces **30** and **32** respectively, thereby retaining it in a desired position within the barrel. The nib holders **20** and **22** likewise grip the wick **24** and prevent a portion of it from expanding to any great extent; moreover, they aid in supporting the tip of the wick when pressure is exerted against it when it is used for marking or coloring purposes.

Since the wick or nib **24** expands in a direction normal to its width, it partially fills the interior of the barrel, in this regard note FIG. 10. As illustrated, the wick expands so that the top and bottom surfaces **30** and **32** respectively, press against the interior of the barrel. Since there is very little, if any, expansion of the wick in a direction parallel to its width, a pair of air gaps or vents **46** and **48** are formed along the sides of the nib. The air gaps extend the entire length of the barrel and are aligned with the ends of the slit-like opening **18** so that continuous passages are formed which extend from one end of the barrel to the other.

Different types of dye solutions can be used for saturating the wick. If, for example, the device is to be used by children as a coloring implement, it might be preferred to saturate the wick with a concentrated water soluble dye. Numerous dyes of this type are commercially available and can be used with excellent results. As an example, dye powders are commercially available in many different hues. A concentrated dye solution can be made by mixing a quantity of the powder with a prescribed amount of water. Two or more different powders might be combined to produce dyes of different hues.

A flange **50** forms an integral part of the barrel proximate its end **14**. The flange serves a number of purposes; it provides an abutment against which the user's fingers can rest without coming in contact with the tip of the nib; it provides a support so that the device can be laid on its side on a flat surface without having the tip **26** contact the surface, and the like.

To assemble the marking device, the compressed wick or nib **24** is inserted into the barrel through the opening **18** in such a manner that the tip **26** remains outside the barrel. Since the nib has a cross-sectional shape which is slightly smaller than the cross-sectional shape of the opening **18**, it will slide out of the barrel if the barrel is vertically oriented or inclined with the tip down. By moistening the tip **26** with a small amount of moisture, the tip will expand so that the nib holders **20** and **22** and the edges **42** and **44** of the opening **18** grip the wick and retain it in position within the barrel. The device is then placed in a dye containing receptacle so that the barrel is vertically oriented and the tip is submerged in the dye solution. The dye flows from the tip **26** toward the opposite end of the wick by absorption and capillary action so that it completely saturates the wick, thus causing it to expand as explained hereinbefore. The device is now ready for use.

If the device is used immediately, it will mark or color a surface against which the tip is contacted. If on the other hand, the tip **26** is exposed to the atmosphere for a period of time, the wick will eventually dry out or dehydrate and the device will not color or mark. By moistening the tip with water, e.g. by dipping it in a water containing receptacle, the moisture flows toward the opposite end of the saturated wick, thus remoistening or hydrating the wick and causing it to color or mark as intended. The device can be used until all of the dye concentration has been leached out of the wick. If preferred, the barrel might be formed of a transparent plastic material so that the saturated wick is visible to the user.

It has been found that the air passages **46** and **48** aid in permitting the water to flow from the tip **26** toward the opposite end of the nib by absorption and capillary action. While FIGS. 1–10 illustrate the barrel as being open in the end **16**, it might be preferred to block the end **16** and merely provide one or more passages in the barrel **12**. FIGURE 11 illustrates a barrel **52** having a closed end **54**, and a pair of passages **56** which communicate with air gaps or passages **57** between a wick or nib **58** and the inner surface of the barrel.

FIG. 12 illustrates another embodiment of the invention which is quite similar to the embodiment described above. In this embodiment, the device includes a tubular barrel **60** having an opening **62** in one end and a pair of nib holders **64**. A cap or cover **66**, having an air passage **68**, is secured to the opposite end of the nib. A sponge wick or nib **70** is positioned within the barrel in much the same manner as that described before, so that one end projects through the opening **62** and forms a tip **72**. The end **74** of the wick is tapered so that it forms a blunt point, and the length of the wick is somewhat shorter than the length of the barrel. Instead of saturating the nib with a water soluble dye solution, a portion of the barrel is filled with a powdered dye **76**, and a wad of cotton **78** is inserted within the end of the barrel for preventing the loose powder from leaking out. The end **74** of the wick is surrounded by the powdered dye. By moistening the tip **72** of the wick with water, the water flows into the barrel by absorption and capillary action toward the opposite end of the wick, until it contacts the dye powder within the barrel. By expressing the water from the tip it draws the dye out of the barrel and leaves a mark on the surface which is being marked or colored. Instead of using a powdered dye, it might be preferred to place a compressed water soluble dye capsule or pellet within the barrel against the wick is juxtaposed. By moistening the wick, the dye leaches out of the tip.

In the above description and attached drawings, a disclosure of the principles of this invention is presented, together with some of the embodiments by which the invention may be carried out.

Now, therefore, I claim:

1. A marking device comprising an elongated tubular barrel having first and second ends, one of said ends having a slit-like opening therein, an elongated wick formed of expandable sponge material positioned within said barrel so that one of its end projects through said slit-like opening thereby forming a tip, the other end portion of said wick terminating within the barrel, means including said slit-like opening for retaining the wick within said barrel, and a source of water soluble dye powder, said dye powder being located within the barrel so that at least a portion of the wick is in intimate contact with said powder.

2. A marking device comprising an elongated tubular barrel having an opening in one end, an elongated wick formed of absorbent capillary material positioned within said barrel so that one of its ends projects through said opening thereby forming a tip, said wick being saturated with a water soluble dye solution, said wick when dehydrated being hydratable by moistening said wick with a fluid medium thereby causing the dye to leach out of the tip portion of the wick, and means for preventing said wick from moving with respect to the barrel, said means including a pair of external, spaced apart nib holders integrally connected to said one end of the barrel in such a manner that they project axially away from said end, the relative spacing between said holders being such that they grip a portion of the wick and prevent it from moving with respect to the barrel.

3. The combination of claim 2 wherein the opening in said one end of the barrel is a slit-like opening which is transverse to the longitudinal axis of the barrel, and the spacing between said holders is substantially the same as the thickness of the slit, said slit-like opening and said holders gripping the wick and preventing it from moving with respect to the barrel.

4. The combination of claim 3 wherein the wick is formed of a sponge material which is expandable when moistened with a fluid medium, and the tip of the wick

when expanded is substantially wider than the spacing between the nib holders and the thickness of the slit-like opening.

5. The combination of claim 3 wherein the wick is formed of a compressed sponge material having a substantially rectangular cross-sectional shape, said sponge being compressed in such a manner that it is expandable in not more than two directions when moistened with a fluid medium.

6. The combination of claim 5 wherein the cross-sectional shape of said compressed sponge material is slightly smaller than the cross-sectional shape of the slit-like opening.

7. The combination of claim 6 wherein one of the dimensions of said rectangular shape is greater than the other, said sponge is expandable in a direction normal to said greater dimension, said sponge when expanded being wider than the thickness of the slit so that it is gripped by the edge of said slit, and a pair of passages are formed within the barrel when the sponge expands.

8. The combination of claim 7 wherein the tip of said wick when remoistened with water causes said dye to leach out of said wick onto a surface.

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U.S. Cl. X.R.

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