

Aug. 5, 1969

W. A. BRASTAD

3,459,483

MARKING DEVICE

Filed March 1, 1967

2 Sheets-Sheet 1

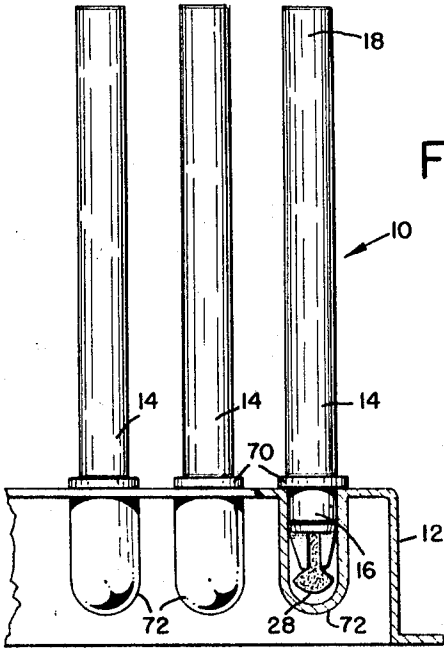


FIG. 1

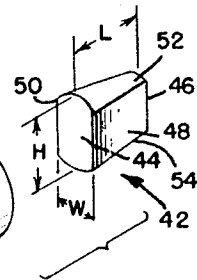


FIG. 2

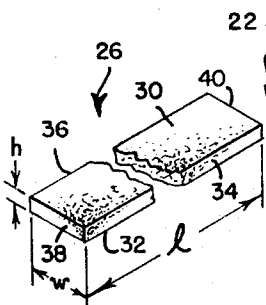


FIG. 3

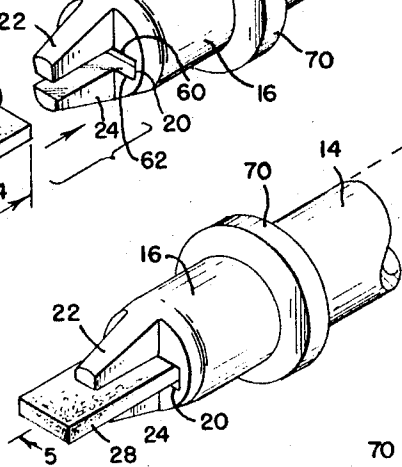


FIG. 4

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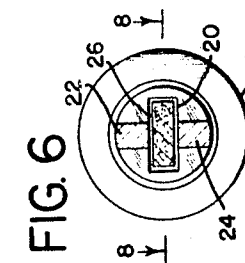
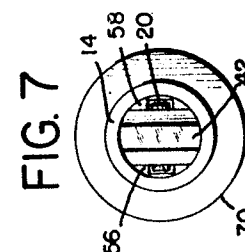
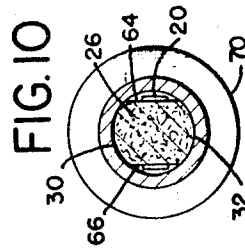
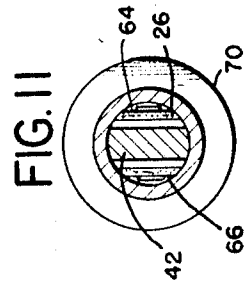
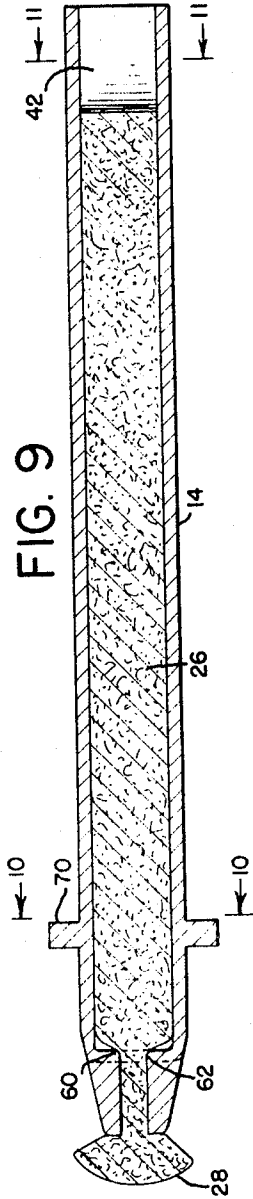
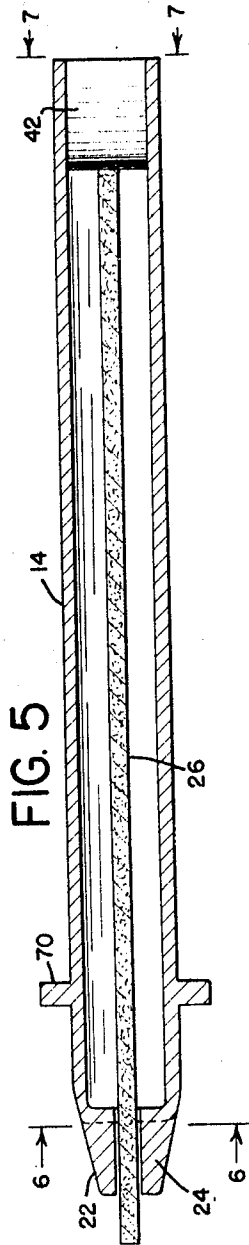
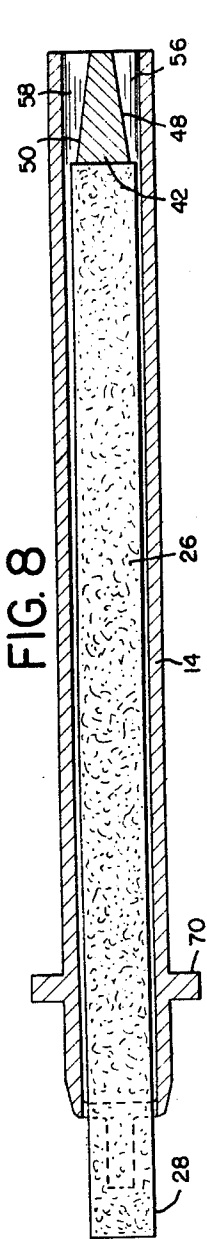
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MARKING DEVICE

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2 Sheets-Sheet 2



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3,459,483

**MARKING DEVICE**

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General Mills, Inc., a corporation of Delaware  
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10 Claims

**ABSTRACT OF THE DISCLOSURE**

A marking device which includes a cylindrical barrel out of which a sponge wick or nib projects, thereby forming a tip. The wick is saturated with a water soluble dye solution, and when the wick is in a moistened condition, the dye will leach out of it onto a surface against which the tip is pressed. A wedge-shaped plug is inserted within the opposite end of the barrel for inducing water to remain in the barrel when that end is dipped in a water source, thereby moistening the wick.

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 devices, 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 multifarious 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, ball-point pens, or the like, is oftentimes unsatisfactory for marking or coloring purposes, because these devices have a point which produces a mark which is too small of 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 dye containing coloring instrument which is readily usable by children as to toy item.

A further object is to provide a marking or coloring

instrument having an improved arrangement for re-moistening the tip when it becomes dried out or dehydrated.

A still further object is to provide a marking device having a coloring tip projecting through one end, which can be readily used after the tip has become dried due to exposure to the atmosphere, by introducing a fluid medium into the opposite end of the device.

Another object is to provide a set of coloring instruments of different hues, which can be stored in an appropriate holder when not in use.

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 openings in both ends. 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. An elongated wedge-shaped plug is press fit within the second end of the barrel, and it forms a pair of tapered passages with the inner surface of the barrel. 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 dye 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 and it can be used for marking or coloring purposes. If the wick becomes dry and hard, it can readily be made to mark or color by submerging or dipping the second end of the barrel in water, thus moistening or hydrating the sponge nib. The wedge-shaped plug induces water to remain in the barrel which is admitted through the tapered passages, the water which contacts the sponge wick flows toward the tip end by absorption and capillary action. By moistening the tip with water in this manner, the dye leaches out of the wick onto a writing or coloring surface against which the tip of the wick is pressed.

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

FIG. 1 is a side elevational view, in partial section, of a set of marking or coloring devices constructed according to the invention;

FIG. 2 is an exploded perspective view illustrating the components of the marking device;

FIG. 3 is a perspective view in partial section of the marking device prior to saturating a sponge wick with a fluid medium;

FIG. 4 is a perspective view in partial section of the marking device after the wick has been saturated with a fluid medium;

FIG. 5 is a sectional view taken along line 5—5 of FIG. 3;

FIG. 6 is a sectional view taken along line 6—6 of FIG. 5;

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. 6;

FIG. 9 is a sectional view taken along line 9—9 of FIG. 4;

FIG. 10 is a sectional view taken along line 10—10 of FIG. 9; and

FIG. 11 is a sectional view taken along line 11—11 of FIG. 9.

FIG. 1 illustrates a marking or coloring device 10 stored in a holding device 12. The marking device includes an elongated tubular barrel 14 having first and second ends 16 and 18 respectively. As depicted in FIG.

2, the end 16 is provided with a slit-like opening 20, while the end 18 is open. A pair of spaced apart projections or nib holders 22 and 24 form an integral part of the barrel end 16, and they are positioned on the barrel so that they project axially away from the barrel end. The space between the nib holders 22 and 24 is substantially the same as the thickness of the slit 20.

An elongated wick or nib 26 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 out of the barrel through the opening 20 in the barrel end, thereby forming a tip 28. The wick is preferably formed of a compressed cellulose sponge material which is cut into strips of predetermined length and width, and the strip is formed so that it has a rectangular cross-sectional shape. As illustrated in FIG. 2, 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 when the sponge is compressed. 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. 2, 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 readily be compressed and expanded, other types of material, such as felt, might be used as well.

An elongated wedge-shaped plug 42 is press fit within the opening in the end 18 of the barrel 14, so that its longitudinal axis is parallel to the longitudinal axis of the barrel. The plug has a first end 44, a second end 46, side surfaces 48 and 50, and top and bottom surfaces 52 and 54 respectively. The first end 44 of the plug is wider or thicker than the second end 46; as a result, the plug varies in width  $W$  from a maximum at the first end to a minimum at the second end; and the sides 48 and 50 converge toward the second end. The height  $H$  and length  $L$  of the plug are substantially the same at all points. The top and bottom surfaces 52 and 54 respectively, are slightly curved, so that they fit within the barrel end, and the cross-sectional shape of the plug is somewhat rectangular, with one dimension  $H$  being greater than the other dimension  $W$ . The plug is inserted within the end 18 of the barrel so that its greater cross-sectional dimension  $H$  is normal to the longitudinal axis of the slit-like opening 20. By inserting the wedge-shaped plug 42 within the barrel, a pair of tapered passages 56 and 58 (note FIG. 8) are formed between the side surfaces 48 and 50, and the inner surface of the barrel.

As shown in FIG. 6, the width of the wick or nib 26 is somewhat less than the longest dimension of the slit 20, and its thickness is somewhat less than the thickness or height of the slit. Thus, the wick can easily be inserted into the barrel by sliding it through the opening 20, until it abuts against the plug 42. As shown in FIG. 3, the compressed wick 26 and the plug 42 are positioned so that they are substantially perpendicular to each other.

After the wick or nib 26 has been positioned within the barrel 14, it is saturated with a dye solution by dipping the tip 28 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 26 within the barrel 14 after the sponge material has expanded. The edges 60 and

62 of the slit-like opening 20 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 22 and 24 likewise grip the nib 26 and prevent a portion of it from expanding to any great extent; moreover, they aid in supporting the tip 28 when pressure is exerted against it when it is used for marking or coloring purposes.

Since the wick or nib 26 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 64 and 66 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 20 and the tapered passages 56 and 58, 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. Moreover, two or more different powders might be combined to produce dyes of different hues.

A flange 70 forms an integral part of the barrel proximate its end 16. 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 28 contact the surface; it provides an abutment or stop for limiting its penetration into a holder; and the like.

The holder 12 is provided with a plurality of receptacles 72 for storing two or more marking devices 10. Each receptacle has a cross-sectional shape which is substantially the same as that of the barrel 14 of the marking device, and it has sufficient depth so that the device can be inserted therewithout having the tip 28 of the nib contact the bottom. As shown in FIGURE 1, the flange 70 limits the penetration of the marking device into the receptacle.

A holder of this type provides a convenient way of storing a set of coloring devices, each device producing a mark of a different color. This is particularly advantageous and desirable if the coloring set is to be used by children for coloring or painting purposes. By positioning each individual coloring device in a receptacle during periods of nonuse, the wick will retain its moistness for a longer period of time than if its tip is exposed to the atmosphere. As shown, the flange 70 in effect, also serves as a lid which covers the receptacle 72.

To assemble the marking device, the compressed wick or nib 26 is inserted into the barrel through the opening 20 in such a manner that the tip 28 remains outside the barrel. Since the wick has a cross-sectional shape which is slightly smaller than the cross-sectional shape of the opening 20, it will slide out of the barrel if the barrel is vertically oriented or inclined with the tip down. By moistening the tip 28 with a small amount of moisture, the tip will expand so that the nib holders 22 and 24 and the edges 60 and 62 of the opening 20 grip the nib 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 28 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 28 is contacted or pressed. If on the other hand, the tip 28 is exposed to the atmosphere for a period of time, the wick will dry out or dehydrate and the device will not color or mark. By submerging or dipping the end opposite the tip end of the barrel 14 into a water containing receptacle a sufficient distance, the wick is contacted by the water and moistened, and the wedge-shaped plug 42 retains, or induces the moisture to remain in the barrel, i.e., the tapered passages 56 and 58. Once the moisture contacts the sponge, it flows toward the opposite end of the barrel, i.e., the tip 28, by absorption and capillary action, thus remoistening or hydrating the nib and causing it to again color or mark as intended. The device can be used in this manner 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. By dipping the end opposite the tip end into the receptacle, the same receptacle can be used for a number of different color producing devices without leaching color out of each device into the water in the receptacle. The continuous passages, including the air passages 64 and 66, aid in the flow of the dye solution toward the end 18 by absorption and capillary action, as well as the flow of water in the opposite direction, by preventing a pocket of air from building up in the barrel.

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 openings in both ends, an elongated wick formed of absorbent capillary material positioned within said barrel so that one of its ends projects through the opening in a first end of said barrel thereby forming a tip, the other end of said wick terminating within said barrel proximate its other end, said wick being saturated with a dye solution, gripping means for preventing said wick from moving with respect to the barrel, and means within said barrel proximate its other end and adjacent to said wick for inducing a fluid medium admitted thereto to remain in the barrel so that it flows toward the first end of said barrel when it contacts the wick.

2. The combination of claim 1 wherein said wick is saturated with a water soluble dye solution, said dye saturated wick when dried being hydrated by moistening it with water, and the other end of said wick abuts against the inducing means.

3. The combination of claim 1 wherein said first end of the barrel has a slit-like opening which is smaller in thickness than the thickness of the wick when expanded, the edges of said slit gripping the wick and maintaining it in a predetermined position within the barrel.

4. The combination of claim 3 wherein at least one passage is provided in the slit-like opening with the expanded wick positioned therein.

5. The combination of claim 4 wherein the wick expands in such a manner that at least one air gap is formed between the wick and the inner surface of the barrel,

said gap extending from one end of the barrel to the other end.

6. The combination of claim 2 wherein the means for inducing the fluid medium to remain in the barrel includes an elongated wedge-shaped plug having a first end which is wider than a second end so that the width of said plug varies from a maximum at said first end to a minimum at said second end, the height of said plug being substantially the same as the inner dimension of the barrel, said plug being positioned within the barrel so that its longitudinal axis is parallel to the longitudinal axis of said barrel, and a pair of tapered passages are formed by the plug and the inner surface of the barrel.

7. The combination of claim 6 wherein the first end of the barrel is provided with a slit-like opening, the plug has a somewhat rectangular cross-sectional shape with one dimension being greater than the other, said plug being oriented within said barrel so that its greater cross-sectional dimension is substantially normal to the longitudinal axis of the slit.

8. The combination of claim 7 wherein at least one air gap is provided within the barrel which extends the length of said barrel, said gap being in alignment with one end of the slit and one of the tapered passages.

9. The combination of claim 2 wherein a flange is provided on the outer periphery of the barrel, said flange being spaced from the first end of the barrel a predetermined distance.

10. In combination, a marking device and holding means for storing said marking device, said marking device including an elongated tubular barrel provided with openings in both ends, an elongated wick formed of absorbent capillary material positioned within said barrel so that one of its ends projects through the opening in a first end of the barrel thereby forming a tip, said wick being saturated with a dye solution, an elongated wedge-shaped plug within the barrel proximate the second opening for inducing a fluid medium admitted thereto to remain in the barrel so that it flows toward the first end of the barrel when it contacts the wick, said holding means including at least two separate receptacles for storing more than one marking device, the cross-sectional shape of said receptacles being slightly larger than the cross-sectional shape of the barrel so that said end of the barrel can be inserted therein so that the tip of the wick is positioned within said receptacle without contacting the inner surface of said receptacle, and means are provided on the barrel for limiting the penetration of the marking device into the receptacle, and effectively covering the receptacle when inserted therein, said limiting means including a flange mounted on the periphery of the barrel which is spaced a predetermined distance from said barrel end, the distance from the tip of the wick to said flange being less than the depth of the receptacle in the holding means.

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U.S. Cl. X.R.

401—198, 201