United States Patent

Mimlitch

[15] **3,703,142**

[45] **Nov. 21, 1972**

[54] **SELF-CENTERING MARKING DEVICE**

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[21] Appl. No.: **80,004**

[52] **U.S. Cl.**.....**101/382 MV,** 33/191, 40/142 A, 101/368, 101/406

[51] **Int. Cl.** **B41k 1/20**

[58] **Field of Search** .....101/368, 382 MV, 405, 406; 40/142 A; 33/191

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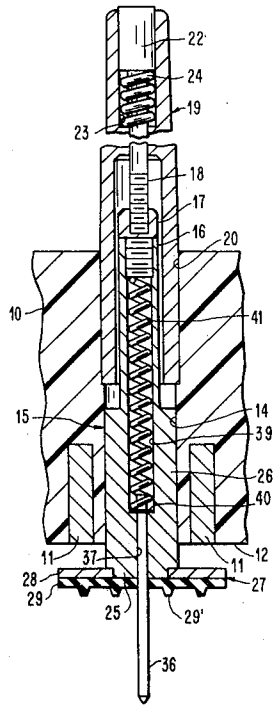
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Primary Examiner—Clyde I. Coughenour
Attorney—Frank C. Leach, Jr.

[57] **ABSTRACT**

A marker, which prints a concentric element such as a nut, bolt, or the like, for example, when moved into engagement with a surface, is retained adjacent one end of a base by magnets within the base. The marker is carried on a protruding portion of a support, which is slidably mounted within the base and carries a locating pin extending longitudinally therefrom and through the marker. When the locating pin is disposed on the surface at the point at which the center of the nut or bolt is to be located, a spring, which acts on the locating pin, is overcome by depressing the base so that the marker can be moved into engagement with the surface at the desired location. After printing, the marker is released from the effect of the magnets by pushing the support away from the base whereby the field of the magnets is no longer effective so that the marker drops off of the support by gravity.

2 Claims, 8 Drawing Figures



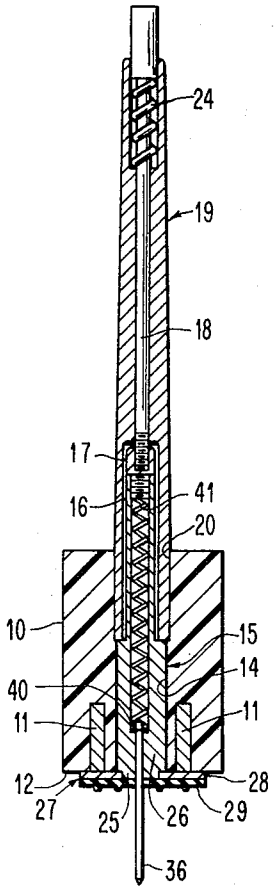


FIG. 1

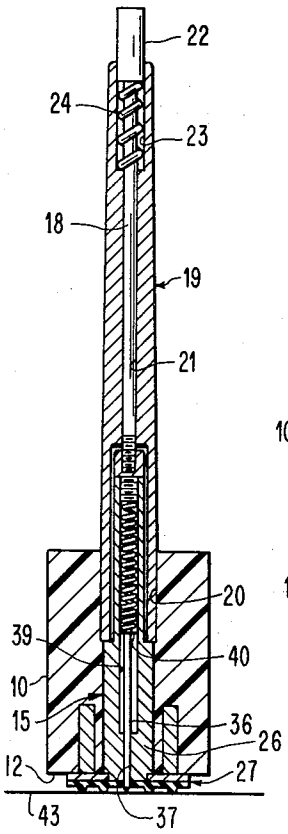


FIG. 2

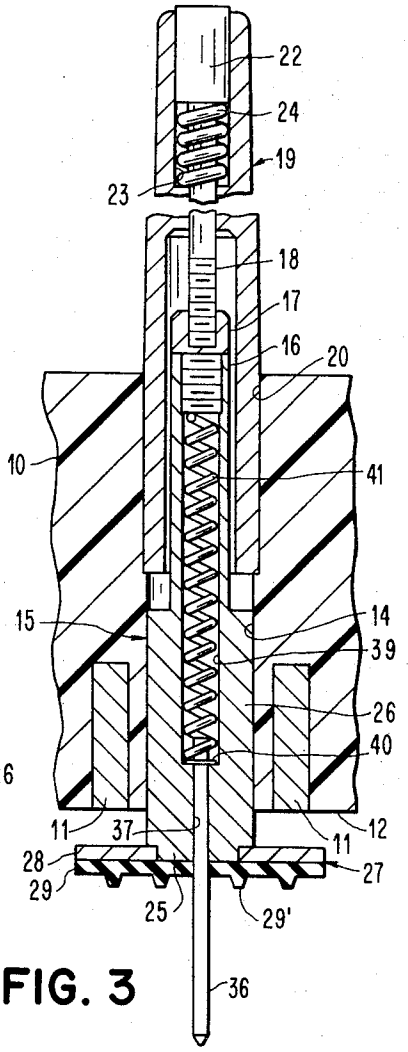


FIG. 3

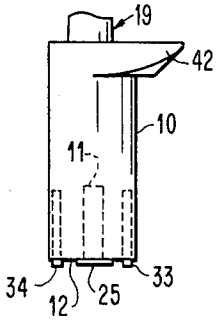


FIG. 5

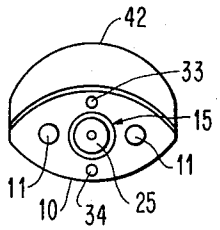


FIG. 4

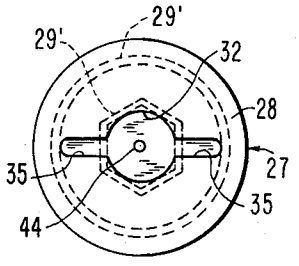


FIG. 6

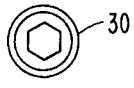


FIG. 7

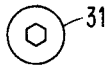


FIG. 8

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SELF-CENTERING MARKING DEVICE

In preparing drawings for various manufactured products, there are numerous bolts, nuts, screws, and other concentric elements employed in the drawings. These various concentric elements are usually drawn with the aid of one or more templates. The use of templates requires precise positioning by the draftsman so that the element, which is being drawn with the aid of the templates, is properly centered.

Furthermore, it is necessary to use more than one template to represent a screw, for example. Thus, the draftsman must center each portion of the element that is being drawn with the aid of a particular template.

While templates are more satisfactory than using drawing instruments to produce various concentric elements on a drawing, they still require a substantial period of time. This is because of the necessity to obtain the correct template, precisely position the particular element on the template at the desired location on the drawing, and then draw the particular element with the aid of the template.

The present invention satisfactorily overcomes the foregoing problems by utilizing a marking device in which the entire element, which can be a bolt, a nut, or a screw, for example, is represented on a marker. In the present invention, the marker is releasably supported by the marking device so that it may be quickly connected to and disconnected from the marking device.

Furthermore, the marking device of the present invention utilizes a locating pin to insure that the marker is properly located when moved into engagement with the drawing. Thus, by disposing the locating pin at the center of the element to be produced on the drawing, the marker of the present invention is properly centered when moved into engagement with the drawing surface.

Accordingly, the present invention enables rapid production on a drawing or the like of various elements, particularly concentric elements such as bolts, nuts, and screws, for example. Therefore, the present invention reduces the time required for a draftsman to prepare a drawing.

Furthermore, a large number of templates is required to form the various elements on the drawings. These can constitute a substantial investment.

Since the present invention eliminates the need for templates, the expense of these templates is eliminated even though one has the expense of the various markers. However, the markers are more durable, and the total cost of the markers and the device is relatively low in comparison with the cost of the templates.

Furthermore, some items cannot be produced by any type of template. The present invention enables the marker to have any element or item formed thereon.

It has previously been suggested in U.S. Pat. No. 2,382,804 to Morrison to support a marking member for disposition at a particular point on a paper surface. However, the structure of the Morrison patent utilizes a threaded support for the marking member. As a result, there is no quick connection and disconnection of the marking member with its support.

Thus, the structure of the Morrison patent is not capable of saving time in comparison with the use of templates, for example, If one used the structure of the Morrison patent, a longer period of time would be required to connect the marking member to the support structure and remove the marking member from the support structure than would be required to properly center templates.

Accordingly, the Morrison patent does not provide a solution to quick production of various elements on a drawing. Instead, a draftsman would find templates a more expedient manner of drawing nuts, bolts, and screws, for example, than the use of the structure of the Morrison patent.

An object of this invention is to provide a device for moving any of a plurality of markers into engagement with the surface of a paper on which an element on the marker is to be printed at a precise location.

Another object of this invention is to provide a device for quickly producing various elements such as nuts, bolts, and the like for example, on a drawing at precise locations.

Other objects of this invention will be readily perceived from the following description, claims, and drawing.

This invention relates to a device for supporting a marker or the like for printing on a surface at a particular location including a base of a non-magnetic material with the base having magnetic means to removably retain the marker adjacent one end of the base. Means prevents rotation of the marker relative to the base when the marker is retained adjacent the one end of the base by the magnetic means. The device has means cooperating with means, which locates the marker at the particular location on the surface for printing, to allow retraction of the locating means when the locating means is pressed against the surface so that the marker may be moved against the surface to print on the surface at the particular location. Means produces relative movement between the marker and the base to remove the marker from the effect of the magnetic means to release the marker.

This invention also relates to a device for supporting a marker or the like for printing on a surface at a particular location including a base. The base has means to releasably retain a marker on means, which is supported by the base for movement relative thereto, and adjacent the base. When the marker is on the supported means, suitable means prevents rotation of the marker. The device has means cooperating with means, which locates the marker at the particular location on the surface for printing, to allow retraction of the locating means when the locating means is pressed against the surface so that the marker may be moved against the surface to print on the surface at the particular location. Means produces relative movement between the supported means and the base to release the marker from the supported means by removing the marker from the effect of the retaining means.

The attached drawing illustrates a preferred embodiment of the invention, in which:

FIG. 1 is a sectional view of the marking device of the present invention with a marker supported thereon;

FIG. 2 is a sectional view, similar to FIG. 1, of the marking device of FIG. 1 but showing the marker moved into engagement with a paper surface;

FIG. 3 is an enlarged sectional view, similar to FIGS. 1 and 2, of the marking device of FIG. 1, but showing the marker being released from the marking device;

FIG. 4 is a bottom plan view of the marking device of FIG. 1 with the marker removed;

FIG. 5 is a side elevational view of a portion of the marking device of FIG. 1 with the marker removed;

FIG. 6 is a top plan view of the marker that is to be used for producing a flathead screw;

FIG. 7 is a plan view of a socket head screw that is the element on one of the markers; and

FIG. 8 is a plan view of a flat head screw that is the element on the marker of FIG. 6.

Referring to the drawing and particularly FIGS. 1–3, there is shown the marking device of the present invention including a base 10, which is formed of a non-magnetic material such as plastic, for example. The base 10 has a pair of magnets 11 disposed therein through its end 12.

The magnets 11 are disposed on diametrically opposite sides of a longitudinal passage 14 in the base 10. The passage 14, which has a circular cross section and extends through the base 10, has a support 15 disposed therein and slidably supported by the base 10.

The support 15, which has a circular cross section, has its upper end 16 threaded to the lower end of a connecting plug 17. The connecting plug 17 has its upper end threaded to the lower end of a release button 18, which is slidably supported within a stem 19.

The stem 19, which is tapered except at its lower end, has its non-tapered lower end disposed within an enlarged upper portion 20 of the passage 14. The non-tapered portion of the stem 19 has a press fit in the base 10.

The release button 18 is disposed within a longitudinal passage 21 in the stem 19 and has an enlarged upper end 22 disposed within an enlarged upper portion 23 of the passage 21, which has a circular cross section. A spring 24, which is disposed within the enlarged upper portion 23 of the passage 21, acts on the lower surface of the enlarged upper end 22 of the release button 18, which has a circular cross section, to continuously urge the support 15 upwardly. The upward movement of the release button 18 by the spring 24 is limited by the upper surface of the larger portion of the support 15 engaging the lower end of the stem 19 as shown in FIGS. 1 and 2.

This uppermost position of the release button 18 disposes the support 15 within the base 10 so that a reduced lower portion 25 of the support 15 extends or protrudes beyond the end 12 of the base 10 as shown in FIGS. 1 and 2. The reduced portion 25 has a smaller diameter than the diameter of the passage 14 while a portion 26 of the support 15 is substantially the same diameter as the passage 14 so as to have sliding movement between the base 10 and the support 15.

The reduced portion 25 of the stem 15 concentrically supports a marker 27 thereon. The marker 27 includes a metallic support plate 28 and a stamping plate 29, which may be formed of rubber, for example. The stamping plate 29, which is secured to the support plate 28 by any suitable means such as glue, for example, may be formed of any material, which is capable of absorbing ink or any other suitable marking medium while retaining the desired shape of the element or item to be produced.

The stamping plate 29 has embosses 29' formed integral therewith. The embosses 29' produce the desired configuration of the element or item that is to be printed on the paper. Thus, for example, the stamping plate 29 could have a socket head screw 30 (see FIG. 7) or a flat head screw 31 (see FIGS. 6 and 8) formed thereon as the element that is to be produced on the paper.

Since the socket head screw 30 can have various diameters and the flat head screw 31 can have various diameters, for example, a plurality of the markers 27 is required. Likewise, the markers 27 may include any other concentric element or item such as bolts and nuts, for example.

The plate 28 has a circular opening 32 (see FIG. 6) therein, which is substantially the same diameter as the diameter of the reduced portion 25 of the support 15. Accordingly, when one of the markers 27 is to be supported on the support 15, the reduced portion 25 is disposed within the opening 32 in the support plate 28 of the marker 27 so that the marker 27 has a sliding fit on the reduced portion 25 of the support 15. The marker 27 is retained on the support 15 because the magnets 11 in the base 10 produce a magnetic field of sufficient strength to retain the marker 27 on the reduced portion 25 of the support 15 and against the end 12 of the base 10.

To prevent rotation of the marker 27, the base 10 has a pair of diametrically disposed locator pins 33 and 34 (see FIGS. 4 and 5) supported therein and protruding the same slight distance (see FIG. 5) from the end 12 of the base 10 as the reduced portion 25 of the support 15 normally protrudes. The locator pins 33 and 34, which are of circular cross section, are disposed within longitudinal slots 35 (see FIG. 6), which are formed in the support plate 28 on opposite sides of the circular opening 32 and in communication therewith. Thus, when the locator pins 33 and 34 are disposed in the longitudinal slots 35, which have a width slightly greater than the diameter of each of the locator pins 33 and 34, the marker 27 cannot be rotated relative to the base 10.

The support 15 carries a longitudinal locating or guide pin 36 of circular cross section within a longitudinal passage 37 of circular cross section in the support 15. The passage 37 has a diameter only slightly larger than the diameter of the locating pin 36 so that the locating pin 36 may slide therein while having a fit therewith.

The locating pin 36 has a portion of reduced diameter adjacent its upper end extending into a longitudinal passage 39 of circular cross section in the support 15. The passage 39 communicates with the passage 37 and has a substantially larger diameter than the diameter of the passage 37.

An E-ring 40, which is supported on the reduced portion of the locating pin 36, has a spring 41, which is disposed within the passage 39 in the support 15, acting against the upper surface of the E-ring 40 to continuously urge the locating pin 36 exteriorly of the support 15 as shown in FIG. 1. The E-ring 40 abuts against the bottom of the passage 39 to limit the outward movement of the locating or guide pin 36 by the spring 41.

Since the locating pin 36 is centered with respect to the reduced portion 25 of the support 15 because the axes of the passages 37 and 39 are aligned with the axis of the passage 14 in the support 15, the locating pin 36 is centered with respect to the marker 27. As a result, whenever the locating pin 36 is disposed at the center of where an element is to be located on a drawing, the marker 27 also will be centered with respect thereto.

Thus, movement of the marker **27** into engagement with the drawing with the stamping plate **29** having ink thereon produces the desired element or item at the proper location.

Considering the operation of the marking device of the present invention, the reduced portion **25** of the support **15** is disposed within the opening **32** in the support plate **28** of the marker **27**, which is to be used to mark an element or item on the drawing. The marker **27** may be stored, for example, in a receptacle in a storage container.

The reduced portion **25** enters the opening **32** in the support plate **28** by pressing downwardly on the base **10** through pushing on the upper surface of a conical portion **42** (see FIGS. **4** and **5**) of the base **10**. As the base **10** is moved downwardly, the force of the spring **41** is overcome by the locating pin **36** not being movable since the locating pin **36** is engaging the bottom of the receptacle for the marker **27** so that the base **10** can slide relative thereto whereby the magnets **11** can act on the marker **27** to retain the marker **27** against the end **12** of the base **10**.

When the reduced portion **25** of the support **15** enters the opening **32** in the plate **28**, the locator pins **33** and **34** are disposed within the slots **35** in the plate **28**. This prevents rotation of the marker **27** relative to the base **10**.

When the base **10** is lifted, the spring **41** immediately forces the locating pin **36** out of the base **10** since the locating pin **36** no longer bears against the bottom surface of the receptacle. The stamping plate **29** of the marker **27** is then moved into engagement with an inked pad or the like to absorb ink therefrom. This is accomplished by moving the base **10** downwardly against the spring **41** and relative to the locating pin **36** through pushing downwardly on the upper surface of the conical portion **42** of the base **10**. After the stamping plate **29** of the marker **27** has received the ink from the inked pad, the downward force on the base **10** is released so that the base **10** moves upwardly due to the spring **41**.

Then, the locating pin **36** is positioned at the desired point on the drawing, and the base **10** is again moved downwardly relative to the locating pin **36** and against the force of the spring **41**. This results in the element or item on the stamping plate **29** of the marker **27** engaging a paper **43** (see FIG. **2**) to be printed. Since the locating pin **36** is concentrically disposed with respect to the reduced portion **25** of the support **15** and the marker **27** is concentrically supported on the reduced portion **25** of the support **15**, the locating pin **36**, which freely passes through an opening **44** (see FIG. **6**) in the stamping plate **29** of larger diameter than the locating pin **36**, is properly disposed at the center of the element or item.

As soon as the element or item has been printed by the stamping plate **29**, the downward force on the base **10** is again released so that the base **10** moves upwardly due to the spring **41**. This removes the marker **27** from engagement with the paper **43**.

The marker **27** is then returned to its proper position in its storage container or the like by positioning the locating pin **36** in the receptacle in the storage container for the marker **27**. At this time, the release button **18** is pushed downwardly against the force of the spring **24** to move the support **15** exteriorly of the end **12** of the base **10** as shown in FIG. **3**. This moves the marker **27** beyond the effect of the magnetic field of the magnets **11** so that the marker **27** is no longer retained on the reduced portion **25** of the support **15** by the magnets **11**. As a result, the marker **27** falls by gravity from the reduced portion **25** of the support **15** into its receptacle in the storage container.

While the present invention has shown and described the marker **27** as being prevented from rotating relative to the base **10** by the locator pins **33** and **34** cooperating with the longitudinal slots **35** in the support plate **28** of the marker **27**, it should be understood that any other suitable means could be employed to prevent rotation of the marker **27** relative to the base **10**. For example, both the support **15** and the opening **32** in the support plate **28** of the marker **27** could be formed with the same polygonal configuration such as a square, for example, whereby there could be no rotation of the marker **27** relative to the base **10**.

While the present invention has shown and described the marker **27** as having an element or item formed on the stamping plate **29** that is concentric to the locating pin **36**, it should be understood that elements or items, which are not concentric to the locating pin **36**, could be employed. The markers **27** would require some type of a locator arrangement such as the locator pins **33** and **34**, for example, to insure their proper location relative to the locating pin **36** even though the elements or items are not concentric.

An advantage of this invention is that an element or item may be quickly printed on a drawing at a desired location. Another advantage of this invention is that it is relatively inexpensive. A further advantage of this invention is that the desired position of the element or item may be easily located and precisely obtained.

For purposes of exemplification, a particular embodiment of the invention has been shown and described according to the best present understanding thereof. However, it will be apparent that changes and modifications in the arrangement and construction of the parts thereof may be resorted to without departing from the spirit and scope of the invention.

I claim:

1. A device for supporting a marker or the like for printing on a surface at a particular location including:

a base;

means supported by said base for movement relative thereto;

said base having means to releasably retain a marker on said supported means and adjacent said base;

said supported means having a portion extending exteriorly of said base and cooperating with the marker to locate the marker exteriorly of said base and adjacent one end thereof;

means to prevent rotation of the marker when the marker is on said supported means;

means to locate the marker at the particular location on the surface for printing;

said locating means extending longitudinally from the exterior portion of said supported means;

means cooperating with said locating means to allow retraction of said locating means when said locating means is pressed against the surface so that the marker may be moved against the surface to print on the surface at the particular location;

and means to produce relative movement between said supported means and said base to release the marker from said supported means by removing the marker from the effect of said retaining means.

2. The device according to claim 1 in which:

said preventing means comprises means supported by said base and extending from said one end of said base;

and said extending means cooperates with means on the marker to prevent rotation of the marker.

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