

Jan. 23, 1968

L. W. LIND

3,364,856

MARKING DEVICE HAVING A PAD INKER AND TUMBLER BED

Filed Nov. 22, 1965

5 Sheets-Sheet 1

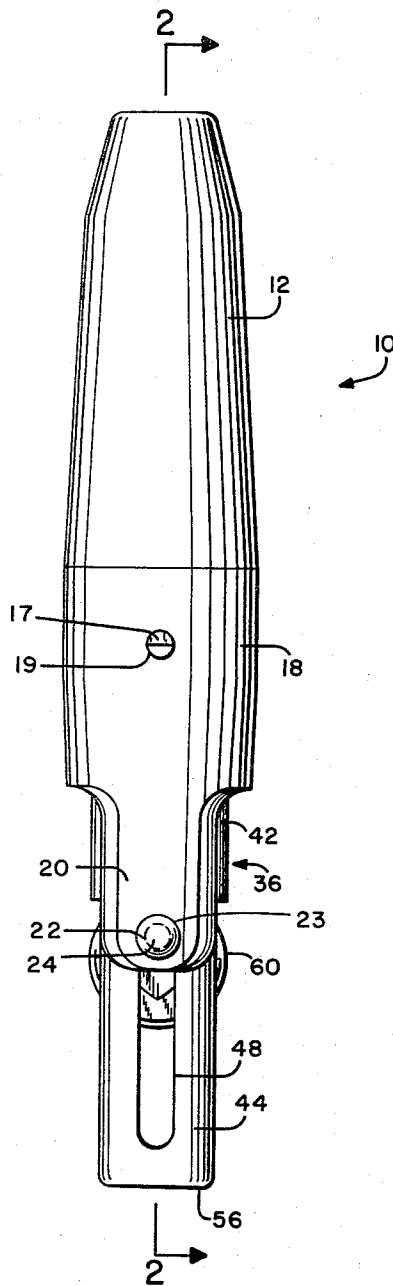


FIG. 1

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5 Sheets-Sheet 2

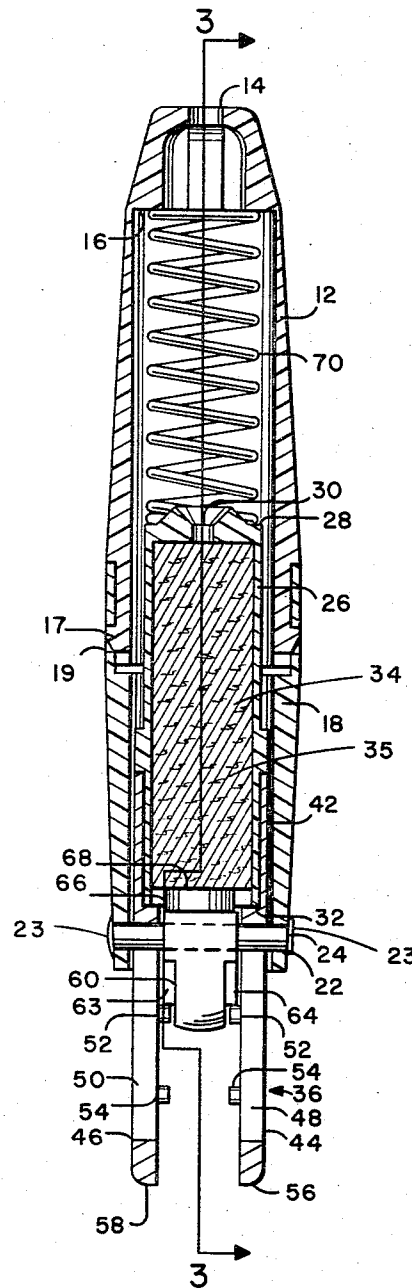


FIG. 2

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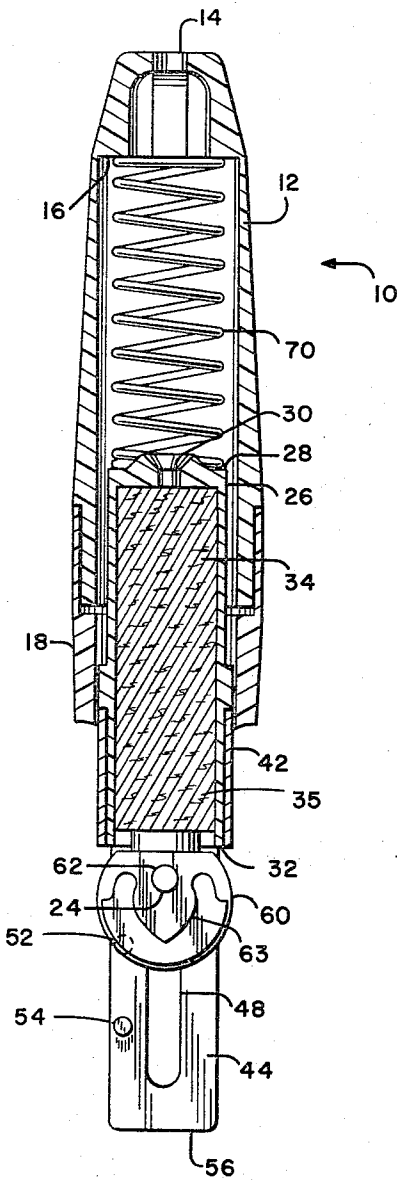
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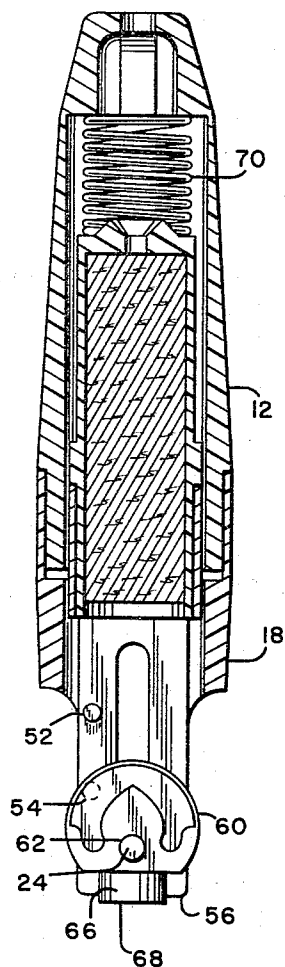
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5 Sheets-Sheet 4



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MARKING DEVICE HAVING A PAD INKER AND TUMBLER BED

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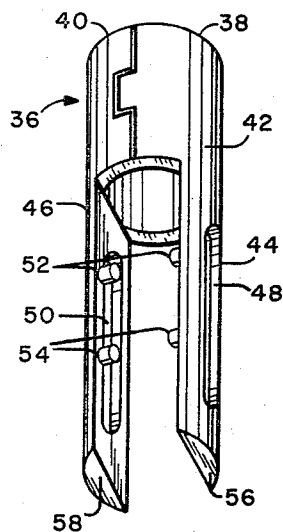


FIG. 5

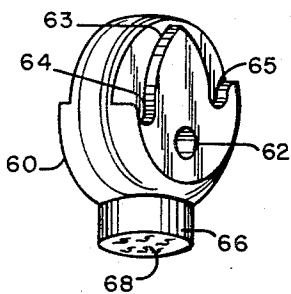


FIG. 6

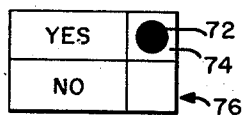


FIG. 7

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3,364,856

MARKING DEVICE HAVING A PAD INKER AND TUMBLER BED

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2 Claims. (Cl. 101—334)

ABSTRACT OF THE DISCLOSURE

A hand actuated marking device for placing marks of uniform density upon a surface. The marking device contains its own supply of marking fluid, and has particular application as a ballot marker for applying a mark of desired configuration and intensity upon ballots for facilitating their automatic processing.

This invention relates to a marking device for applying a uniform mark onto a surface, and more particularly to a ballot marker for applying a mark of desired configuration and intensity upon ballots for facilitating their automatic processing.

Various systems for the automatic processing and counting of ballots rely upon the "recognition" of a mark as being that placed upon the ballot by the voter, and a determination of the relative location of each mark on the ballot. Such systems include the scanning detection method described in the patent to Holzer et al., Patent No. 3,218,439, issued Nov. 16, 1965, the photoelectric detection system of Fechter et al., Patent No. 2,940,663, issued June 14, 1960, and the electrical conduction detection system of Keith, Patent No. 2,750,108, issued June 12, 1956.

Success of each of these systems however, is dependent to a great extent on the quality of individual marks, relative to optimum specifications determined by the range of sensitivity of the recognition apparatus of the machine. The criteria are usually uniformity of distribution of the recognition sensitive substance which comprises the basis of each mark, and of even greater importance, uniformity from mark to mark. The conventional ballot marker used with paper ballots is frequently a rubber stamp "X" which is inked from a pad by each voter and then pressed upon the ballot. The mark produced by such a stamp is unsatisfactory for use with the automatic counting machines, not only because of variations in inking and marking pressure used among voters and even by the same voter, but also because the mark produced does not cover a sufficiently large area for satisfactory high speed recognition.

The prior art includes a device which has been used as a date stamp, such a device being characterized by a marking element normally in contact with a stamp pad but which is flipped over in use to place a date mark on a surface. In that device, the marking element contains lateral extensions which engage two stationary tracks on the body of the device, these tracks being designated to flip the marking element and to position it in a marking position when a downward force is applied to the horizontal axis of the element. The bulkiness of the device, made necessary by the tracks and the support required to hold the tracks, make this device insufficient for ballot marking since the mark cannot be simply and accurately positioned in the square allotted for the marking of the ballot.

A device made expressly for the marking of ballots is described in the patent to Petterson, Patent No. 3,045,593, issued July 24, 1962. This device is characterized by the triggering of an ink impregnated pad and its propulsion by a force provided by a spring, causing the marking pad to strike the surface to the mark. The present invention

does not rely upon such impact forces, is characterized by a rotating cam and cam-driving pin combination, and is further distinguished by having its marking element reinked after each use.

According to the present invention, there is provided a hand-actuated device which places a relatively large mark on a surface, the mark conforming to desired characteristics. Furthermore, the device is simple to use and is inexpensively fabricated. It is characterized by the combination of:

(a) Housing means adapted to be held in the hand;
(b) Marking medium supply means located in said housing means;

(c) Marking means;

(d) Rotatable cam means to which said marking means is attached, for causing said marking means to rotate;

(e) Support means adapted to be placed into contact with the surface to be marked and connected to telescope into said housing means, said support means including cam-driving means for rotating said cam means in response to relative motion between said housing means and said support means, and guide means located on said support means for guiding longitudinal movement of said cam means with respect to said driving means so that said marking means are alternatively in contact with the surface to be marked and with said supply means; and

(f) Biasing means for normally retaining said marking means in a retracted position within said housing means such that said marking means is in contact with said supply means, and for retracting said marking means from a marking position to said retracted position.

In a preferred embodiment of the present invention, the housing is held in the hand and the support is placed in contact with the surface to be marked. Downward movement of the housing, relative to the surface, causes the support to telescope into the housing. A rotatable cam member is eccentrically mounted in the housing, and rides in a slot of the support; the cam member has a marking element on one end which is normally in contact with an ink supply reservoir. The downward motion of the housing causes the cam to engage cam-driving pins, suitably located on the support, which rotate the cam and the marking element into marking position. A quantity of the marking ink is deposited in a mark of desired configuration and intensity upon the surface to be marked. Release of the downward force on the housing allows an internal spring to replace the housing to its normal position, thereby returning the cam to the retracted position where the marking element is placed in contact with the ink reservoir.

The novel features which are believed to be characteristic of the invention, together with further advantages thereof, will be better understood from the following description considered in connection with the accompanying drawings in which a preferred embodiment of the invention is illustrated by way of example. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only, and are not intended as a definition of the limits of the invention.

FIG. 1 is a front view of a preferred embodiment of the marker of the present invention;

FIG. 2 is a side sectional view of the marker of FIG. 1 taken along the line 2—2, in the direction of the appended arrows;

FIG. 3 is a side sectional view of the marker of FIGS. 1 and 2 taken along the line 3—3 of FIG. 2, in the direction of the appended arrows in the normal, retracted position;

FIG. 4 is the view of FIG. 3 showing the components of the marker in the marking position;

FIG. 5 is a perspective view of the support element of the marker;

FIG. 6 is a perspective view of the cam member with attached marking element, of the preferred embodiment; and

FIG. 7 is an idealized view of a ballot voting square with an appropriate voting mark therein.

Referring to the drawings, there is shown in FIG. 1 a preferred embodiment of a marker 10 according to the present invention. The operating details of the device will be better understood by considering FIG. 1 with FIGS. 2, 3 and 4, in which longitudinal cross sections of the marker 10 are shown. A top housing part 12 includes a top end containing a breathing aperture 14. An internal, upper bearing surface 16 is provided in the top part 12. A bottom housing part 18 is also provided and the two are joined by a pair of resilient pins 17 which fit into corresponding apertures 19 in the bottom housing part 18.

The bottom housing part 18 is essentially an open ended cylinder with two longitudinal projections or legs 20, these legs being 180° apart. Each leg 20 contains a radially aligned aperture 22 near its end, through which a connecting pivot pin 24 is inserted. The end caps 23 retain the connecting pin 24 within the apertures 22.

A cylindrical ink cartridge 26 is carried within the housing 12, 18. The cartridge 26 has a small, breathing aperture 30 at its "top" end 28. The "bottom" 32 is substantially open, while the interior of the cartridge 26 is packed with a highly absorbent material 34, for example, felt, which is impregnated with a suitable marking medium such as ink 35. The bottom 32 then serves as a "stamping pad."

A support is shown in greater detail in FIG. 5. The support 36 consists of two fittings 38, 40, which when assembled forms a tube 42 having an outside diameter slightly smaller than the inside diameter of the bottom housing 18. Two longitudinal arms 44, 46, project downward from the tube 42. The inside surfaces of the arms 44, 46, are planar and substantially parallel to each other.

A longitudinal slot 48, 50 is located in each of the arms 44, 46, respectively, and the width of these slots is sufficiently large to accommodate the pivot pin 24 by which the support fixture 36 is slidably connected into the bottom housing 18.

Two pairs of cam driving pins 52, 54 protrude from the inside surface of the longitudinal arms 44, 46. The pins are positioned to engage the operating surfaces of a cam 60. The bottom surfaces 56, 58 of the arms 44, 46 are adapted to be placed into contact with the surface to be marked, and are used to locate where the mark will be placed.

The cam 60 is shown in greater detail in FIG. 6, and, as shown, has an aperture 62 through which the connecting pivot pin 24 is inserted. The cam 60 is free to rotate about the pivot pin 24 and is secured to the bottom housing 18. Two identical cam surfaces 63 are provided each on opposite sides of the cam 60, adapted to cooperate with the pair of cam driving pins 52, 54 located on the support fixture 36, in such manner that longitudinal movement of the cam 60 with respect to the support 36 will cause 180° rotation of the cam 60 about the pivot pin 24. The upper pair of pins 52 first engage a first pair of cups 64 of the cam surfaces 63, and rotate the cam 60 approximately 90°. The lower pair of pins 54 then engage the cam surfaces and continue the rotation through an additional 90° until the second pair of cups 65 is engaged.

A marking element 66, consisting of a resilient material, has a marking surface 68. The marking element 66 is fastened to a flat surface of the cam 60, opposite the cam surface 63.

A spring 70 is located inside the top housing element 12 and is compressed between the internal bearing surface 16 of the top housing 12, and the top end 28 of the cartridge 26. The spring 70 biases the cartridge 26 longitudinally downward against the support fixture 36.

The normal position of the cam 60 is such that the marking surface 68 of the marking element 66 is in con-

tact with the in-impregnated stamp pad surface of the cartridge 26. This configuration is best seen in FIGS. 1, 2 and 3. The marker 10 is operated by placing the bottom surfaces 56, 58 of the support fixture 36 into contact with the surface to be marked, i.e., the ballot. By careful positioning with respect to the voting squares, the location of the mark can be determined. Downward manual pressure on the housing 12, 18 causes movement relative to the support fixture 36, toward the surface to be marked. This action causes the longitudinal arms 44, 46 of the support fixture 36 to telescope into the bottom housing 18. The movement of the pivot pin 24 carries the cam 60 to engage the cam driving pins 52, 54 with the cam surface 63. The cam 60 rotates 180° as explained above, causing the marking surface 68 to rotate to the marking position, shown in FIG. 4. When the marking surface 68 is in such a marking position, a limited amount of downward travel is still possible so that a desired quantum of the marking ink 35 is deposited to create a mark of desired characteristics upon the ballot. Thereafter, a gradual release of the housing 12, 18 permits the spring 70 to expand, driving the housing away from arms of the support 36. The pairs of cam driving pins 52, 54 re-engage the cam surfaces 63, again causing rotation of the cam 60 and the marking surface 68, replacing the marking surface 68 in the retracted position, in contact with the stamp pad surface of the cartridge 26.

It is noted that the handle, having an upper and lower housing, may be easily dismantled by a twisting motion, facilitating the replacement of the ink cartridge when necessary. Furthermore, any desired marking element may be used in order to produce any desired shape of mark, for example the marking element shown in FIG. 6 will produce a circular shaped mark 72, shown in FIG. 7 as being placed in a square 74 of a portion of a ballot 76.

Thus there has been shown an embodiment of a device for applying a print mark onto a surface. The embodiment shown is adapted to be held in the hand, is simple to operate by merely applying a downward pressure to the handle, and is useful as a ballot marker in conjunction with a system for the automatic processing and counting of ballots.

Other embodiments of the present invention and modifications of the embodiment herein presented may be developed without departing from the essential characteristics thereof. Accordingly, the invention should be limited only by the scope of the claims appended below.

What is claimed as new is:

1. A device for applying a mark to a surface, comprising:
 - (a) housing means adapted to be held in the hand, including
 - (i) a cylindrical top housing part including a top end having an internal bearing surface, and an open bottom adapted to be connected to a bottom housing part, and
 - (ii) a bottom housing part, adapted to be connected at its top to said open bottom, said bottom housing part being an open ended cylinder having a pair of longitudinally extending members on opposite sides of said cylinder, said members each having a radially aligned aperture near the ends of said members;
 - (b) marking medium supply means located in said housing means, including a substantially cylindrical cartridge having a top end and an open bottom, the interior of said cartridge containing a highly absorbent material adapted to be impregnated with a fluid marking medium;
 - (c) a cam, and a connecting pin, said cam having an aperture through which said cam is connected to said housing means at said radially aligned apertures by said connecting pin, said cam being rotatable about said connecting pin;
 - (d) marking means, attached to said cam, including a

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marketing element of a resilient material and having a marking surface;

(e) support means adapted to be placed into contact with the surface to be marked, including

(i) a tubular member concentrically fitting within said housing means and arranged for telescoping axially therein, said support means having two longitudinal arms projecting downward from said tubular member, the inside surfaces of said arms being substantially planar and parallel,

(ii) a plurality of cam driving pins projecting from said inside surface of one of said longitudinal arms,

(iii) a longitudinal guide slot located in each of said arms through which said connecting pin is inserted, connecting said arms to said bottom part of said housing means in such manner that said arms are permitted to telescope into said housing means; and

(f) a spring member between said internal bearing surface of said top housing part of said housing means, the lower end of said spring member bearing against said top end of said cartridge of said marking medium supply means, said cartridge in turn bearing longitudinally downward against said support means, said spring member providing means for retaining said marking element in a retracted position within said housing means such that said marking element is in contact with said supply means, and providing

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means for retracting said marking element from a marking position to said retracted position;

whereby, movement of said housing means relative to said support means in a telescoping direction causes said marking element to be placed in said marking position, after which release of said housing means causes oppositely directed relative movement, causing said marking element to be placed in said retracted position.

2. The device of claim 1, above, wherein said plurality of cam driving pins project from said inside surfaces of both of said longitudinal arms, said pins being arranged in pairs which are adapted to alternatively cooperate with said cam in order to cause rotation of said cam.

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