C. B. THWING.

INKING APPARATUS.

APPLICATION FILED NOV. 30, 1918.

1,360,823. Patented Nov. 30, 1920.

Fig. 1.

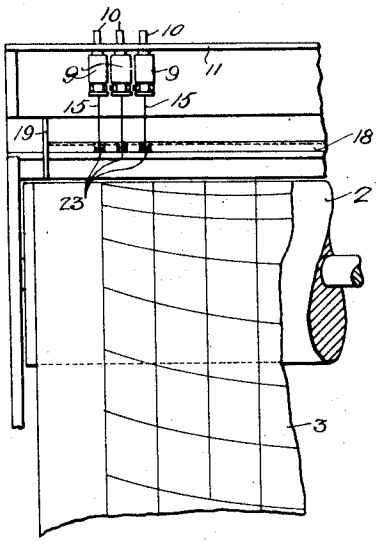


Fig. 2.

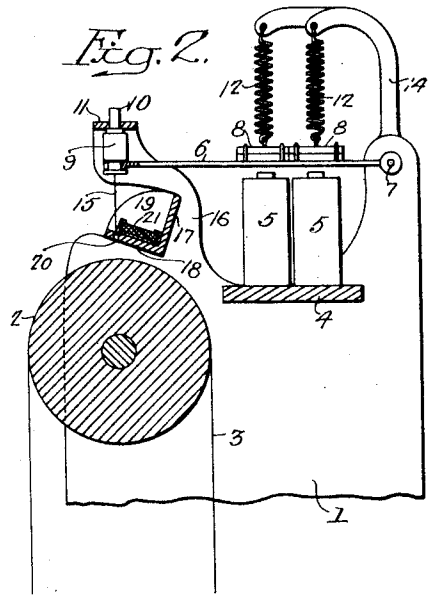


Fig. 4.

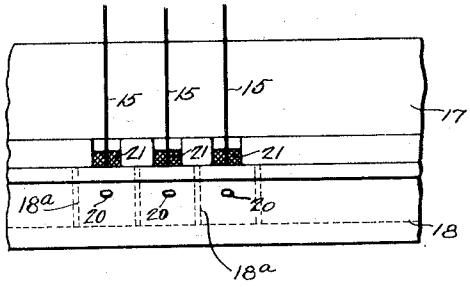
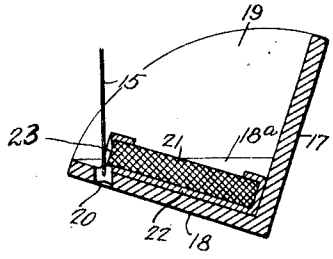


Fig. 3.



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UNITED STATES PATENT OFFICE.

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INKING APPARATUS.

1,360,823. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed November 30, 1918. Serial No. 264,874.

To all whom it may concern:

Be it known that I, CHARLES B. THWING, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented Inking Apparatus, of which the following is a specification.

One object of this invention is to provide a relatively compact, simple and reliable device for inking the pens or styli of recording instruments, particularly those designed to form a succession of dots or other marks upon a suitably supported sheet;—the arrangement of parts being such as to insure a supply of inking fluid to one or any number of pens or equivalent devices assembled and actuated within a relatively confined space.

The invention further contemplates a form of ink supplying device which shall be accessible, easily cleaned and filled, and of such a nature as not to require attention for long periods of time.

These objects and other advantageous ends I attain as hereinafter set forth, reference being had to the accompanying drawings, in which,

Figure 1 is a fragmentary front elevation of a portion of a recording instrument illustrating my invention as applied thereto;

Fig. 2 is a side elevation, partly in vertical section, further illustrating the instrument shown in Fig. 1;

Fig. 3 is an enlarged vertical section of the ink pad and its holder; and

Fig. 4 is a front elevation of the structure shown in Fig. 3.

In the above drawings 1 represents part of a supporting frame work providing bearings for a rotatable drum 2 over which is hung a record sheet 3. Also carried by this frame is a transverse bar 4 supporting any desired number of motors such as electromagnets 5, whereby motion may be intermittently imparted to horizontally extending bars or strips 6 each having one end pivoted to the frame 1 at 7, and in the present instance, each carrying an armature 8 for its magnet.

The opposite end of each of the bars 6 is forked for the reception of the neck of a block 9 constituting a head. The upper end of each head has an extension 10 slidably guided through an opening in a cross bar 11 of the frame and is preferably maintained in its uppermost position by or tends to move to such position under the action of, a spring 12 operative between the upper end of a bar 14 forming part of the frame 1 and the armature 8. Each of the blocks 9 also carries a downwardly extending needle or stylus 15 of such length that its lower end will strike the record sheet 3 on the roll 2 when the bar 6 is drawn downwardly by energization of its magnet 5.

For applying ink to such a stylus or series of the same, I provide a reservoir in the shape of an elongated trough or holder which in its preferred form consists of two flat members 17 and 18 at right angles to each other, having end members 19 and so supported on the frame 1 that the bottom member 18 of the trough lies at an angle of from twenty to thirty degrees to the horizontal. This reservoir is provided with a series of holes 20 formed through its bottom member 18 adjacent its outer edge, in such positions as to receive and permit the passage of the needles 15 and the mounting of the reservoir is such that when the blocks 9 with their needles are in their uppermost positions, the lower end of each needle extends just within its particular hole or passage 20.

Extending longitudinally within the trough 16 is a pad 21 of felt or other absorbent material preferably mounted in a frame 22 consisting of a flat strip having its longitudinal edges turned up and over and so made that one of said edges has a series of notches 23, to permit of the free passage of the needles 15. The width of the pad 21 and of its frame 22 is such that when they rest upon the bottom member 18 of the reservoir, with one longitudinal edge of the frame in engagement with the member 17, the notches of the opposite edge are practically concentric with the several holes 20, and the outer edge of the pad is immediately adjacent the needles.

When the pad is filled or saturated with a suitable liquid ink, there is formed in each of the openings 20 a drop or film which is at all times maintained by capillary action and supplied from the pad. As long as the needles are in their elevated positions their lower ends lie within these films or drops, so that when upon energization of any one of the magnets or motors 5, the corresponding rod 6 is drawn down against the action of its spring 12, it carries with it the block

9 and its associated needle 15 until the lower end of the latter strikes the record sheet with the result that this is thereupon marked by the liquid ink on said needle. Upon the deënergization of the magnet 5, the spring 12 restores the bar 6 to its upper position, and returns the lower end of the needle into the ink film within its hole 20 so that it is instantly ready to make another record mark. It is therefore immaterial whether the needle is operated with great frequency or only at long intervals, since after each downward movement, its point is returned to the ink film and is at all times prepared to make a mark upon the record sheet. It will be noted that the cross bar 11 serves as a guiding means for the various block extensions 10 and also limits the upward movement of said blocks.

In order to replenish the ink supply it is merely necessary to pour liquid ink onto the absorbent pad at any part thereof, whereupon it spreads by capillary action and automatically maintains the films in the various holes 20. It is to be understood that if desired the pad 21 may be omitted and the ink placed directly in the trough 18, since as with the pad the various passages 20 are supplied as before.

Without departing from my invention I may place transverse partitions 18^a in the trough 18 so as to make it possible to supply inks of different colors to any or all of the styli.

I claim:

1. The combination of a reciprocable stylus; mechanism for causing longitudinal movement of the stylus; a member having an opening in the path of movement of the stylus; means for supporting a record sheet in position to be engaged by the stylus when it is actuated; and an absorbent element mounted adjacent said opening and to one side of the path of movement of the stylus in position to maintain a film of ink by capillary action in said opening.

2. The combination of a supporting structure; an oscillatory arm mounted thereon; means for limiting the movement of the arm to a single plane; a stylus carried by the arm; means for intermittently actuating the arm to depress the stylus; a device for supporting a record sheet in position to be engaged by the stylus when it is depressed; a member having an opening in the path of movement of the stylus; and a liquid holding device for maintaining a capillary film of liquid in said opening.

3. The combination of a supporting structure; a bar mounted to oscillate thereon: a stylus carried by the bar and projecting substantially at right angles thereto; means for intermittently oscillating the bar; a plate having an opening and mounted in position for the end of the stylus to lie within said opening when the bar is at one extreme of its path of movement; a liquid holding structure mounted adjacent the opening in position to maintain a film of ink therein by capillary action; and a device for supporting a record sheet in position to be engaged by the stylus when the bar is at its other extreme of movement.

4. The combination of a supporting structure; a series of bars mounted thereon in positions to oscillate in parallel planes; a stylus carried by each bar; means for supporting a record sheet in position to be engaged by the styli of said bars; independent devices for actuating the bars; a trough having a series of independent openings respectively in the lines of movement of the styli; and an ink absorbent structure mounted in position to maintain capillary films of ink in said openings.

5. The combination of a supporting structure; a series of bars mounted thereon in positions to oscillate in parallel planes; a stylus carried by each bar; means for supporting a record sheet in position to be engaged by the styli of said bars; and an ink trough having a series of independent openings respectively in the lines of movement of the styli.

6. The combination of a plurality of styli; independent devices for reciprocating said styli in parallel lines: means for supporting a record sheet in a position to be engaged by said styli; a trough having openings for the styli respectively and extending substantially at right angles to the latter; with an ink pad extending in the trough adjacent said openings in position to maintain capillary films of ink therein.

In witness whereof I affix my signature.

CHARLES B. THWING.