Oct. 22, 1935. W. R. CUTHBERT 2,017,843

REPRODUCING MACHINE

Filed July 9, 1934 2 Sheets-Sheet 1

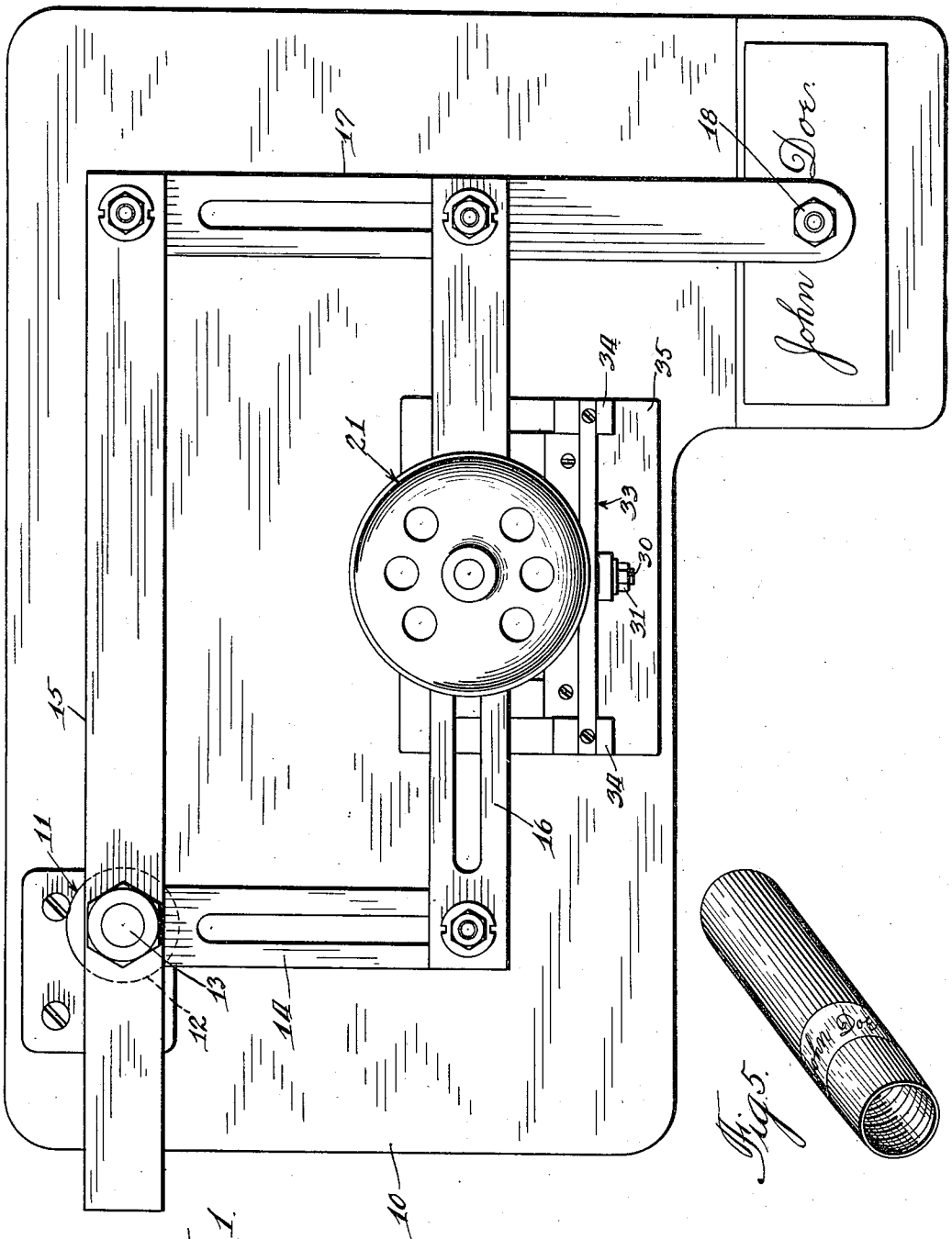

Fig. 1.

Fig. 5.

Inventor:
William R. Cuthbert
By: Jones, Addington, Amsor & Seibold.
Attys.

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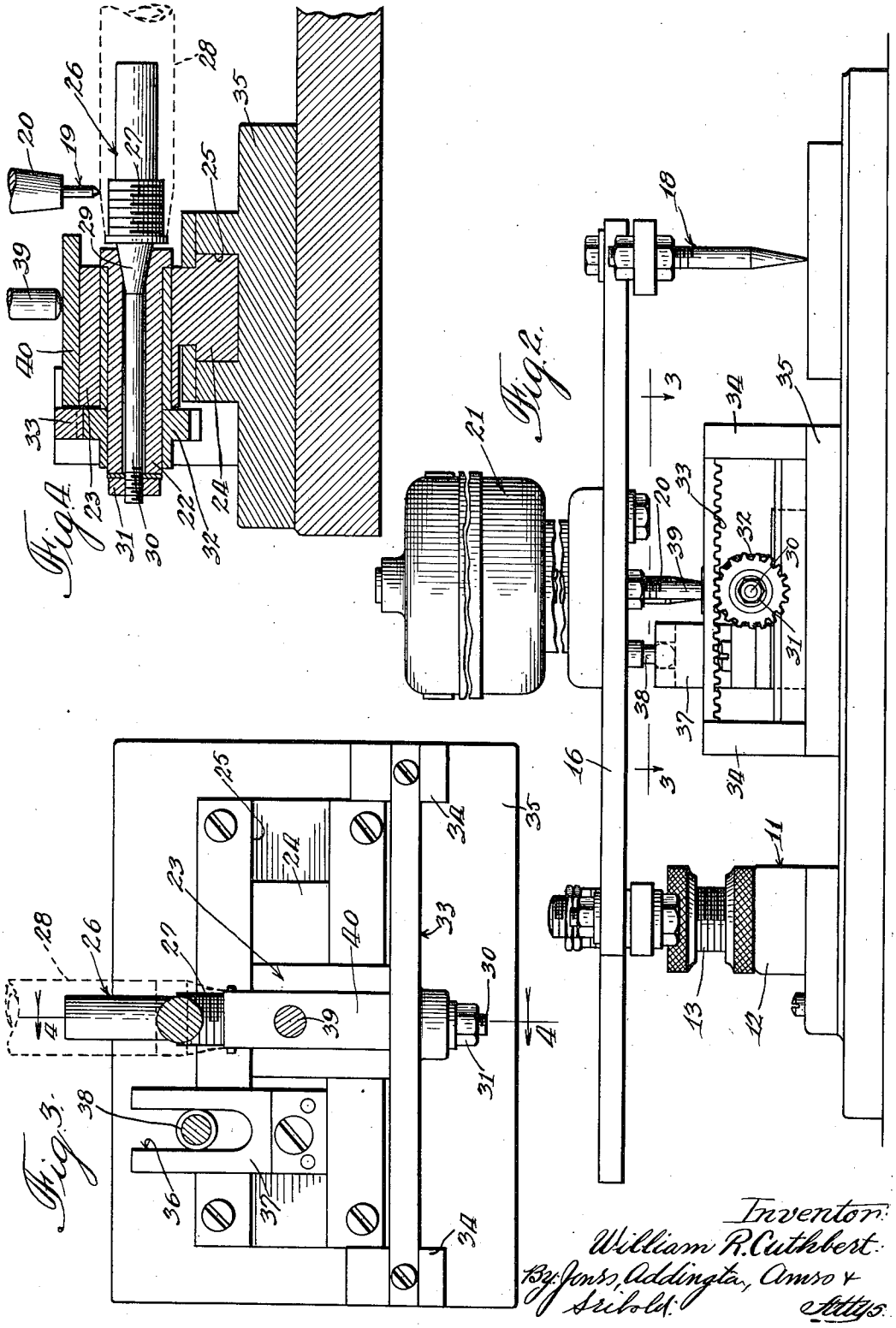

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REPRODUCING MACHINE

William R. Cuthbert, Fort Madison, Iowa, assignor to W. A. Sheaffer Pen Company, Fort Madison, Iowa, a corporation of Delaware

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6 Claims. (Cl. 33—22)

This invention relates to a reproducing machine and has special reference to a construction of the pantograph type for copying outlines of a flat template on a cylindrical surface.

More particularly, this invention relates to a work support rotatably mounted on a carriage cooperating with a pantograph which includes a fixed point, and linkage mechanism extending therefrom, carrying a tracing point for moving over a flat outline and a second tracing point for making the desired copy on the work, there being means for connecting the pantograph and the carriage for movement of the latter in a direction transversely of the axis of the rotatable work support, and there being means between the carriage and the support to rotate the support upon transverse movement of the carriage for continuous alignment of the axes of the support and the second tracing point.

The present invention contemplates the provision of a translating device for use in connection with a pantograph, particularly where an engraving tool is used to operate upon work such as fountain pens, rings, articles of jewelry and the like having cylindrical surfaces. In the particular embodiment illustrated and shown the device has been adapted for use in connection with gold circular bands on fountain pens to copy the signature of the individual thereon from a flat template.

In high grade fountain pens it has been found desirable for the dealer to engrave on the gold band of the fountain pen a copy of the signature of the purchaser, the purchaser merely signing his name on a piece of paper which may be placed upon a predetermined area on the support for the pantograph, one of the tracing points moving over the flat outline and the second tracing point, in this instance an engraving tool, making the desired copy on the cylindrical surface of the fountain pen barrel.

One of the objects of this invention is to provide a reproducing machine of the type hereinabove described in which an outline of a flat template may be copied on a cylindrical surface.

Another object of this invention is to provide a reproducing machine of the type hereinabove noted which is simple in construction and operation, comparatively inexpensive to manufacture and is durable.

Other objects and advantages will hereinafter be more particularly pointed out, and for a more complete understanding of the characteristic features of this invention reference may now be had to the following description when taken together with the accompanying drawings in which latter:

Figure 1 is a top plan view of a construction embodying the features of this invention;

Figure 2 is a front elevational view of the construction of Figure 1, with sections broken away;

Fig. 3 is a plan view of the work support and carriage therefor, the view being taken on the line 3—3 of Fig. 2;

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 3; and

Fig. 5 is a perspective view of a cap of a writing instrument in a completed state with the signature of a purchaser copied on the gold band thereof.

Referring now more particularly to the drawings, the construction of this invention comprises a supporting base 10 having an upright 11 mounted thereon, the upright comprising an internally threaded casing 12 for receiving a threaded adjustment screw 13 for determining vertical adjustment of the height of the pantograph. The upright 11 serves as a fixed point for linkage mechanism which extends therefrom, the linkage mechanism comprising arms 14, 15, 16 and 17, the arms 14 and 15 being pivotally mounted on the fixed point or upright 11, and the arms 16 and 17 being pivotally mounted on the other ends of the arms 14 and 15, respectively. The arms 16 and 17, in turn, are pivotally secured together at their other ends.

The arm 16 is adjustably secured to the arms 14 and 17, the latter arms being provided with longitudinally extending slots for receiving any desired connecting bolts operating as pivotal points. This adjustment, of course, provides for an adjustment in the size of the reproduction which will hereinafter be more fully understood.

A tracing point 18 in the form of a scribe or pointed instrument is secured to an extending end of the arm 17. A second tracing point in the form of an engraving tool 19 is mounted on the arm 16, the engraving tool extending from an adjustable shank 20 of a motor 21. The motor 21 is longitudinally adjustably mounted on the arm 16 for purposes of adjustment in the size of the copy, and this adjustment is made in cooperation with the adjustment for the arms 14 and 17.

This above described pantograph construction is one of many which it may be desired to employ in connection with the particular type of work support to be hereinafter more fully described. It is to be understood, therefore, that the pantograph mechanism may be altered at

will and may be replaced from that particularly shown and described above without departing from the spirit of this invention.

The present invention contemplates the provision of a work support for holding cylindrical objects in position to receive a desired copy from a flat outline. The work support preferably comprises a sleeve 22 rotatably supported in a carriage 23, the carriage 23 having a guide 24 for movement in a guideway 25 transversely of the axis of the sleeve 22. The sleeve 22, in turn, receives a mandrel 26, which latter may be of any desired character, shape and size for supporting cylindrical objects of different shapes and forms. In the present instance, the mandrel is for use in connection with caps for fountain pens, the mandrel having a threaded portion 27 for receiving the threaded end of a cap 28.

The cap is screwed on to the threaded portion 27 until the end of the cap abuts the shoulder and is thus in position to receive the copy on the gold band thereof. The threaded portion 27 of the mandrel 26 extends from a reduced tapered shank 29, the taper converging toward a shaft 30 which passes through the sleeve and extends therebeyond to receive a nut 31. A tightening of the nut on the shank 30 produces a fixed relation between the sleeve and the mandrel, although such mandrel may be readily removed when desired.

In order to rotate the sleeve 22 and thereby the mandrel 26 with the cap mounted thereon in conformity with the movement of the pantograph for continuously aligning the axes of the mandrel and the engraving tool 19, a pinion 32 is fixedly mounted on the sleeve 22 for engagement with a rack 33. The rack 33 extends in the direction of the guideway 25 and is mounted on end supports 34 extending from the supporting base 35, in which the guideway 25 is formed.

In the operation of the rotatable work support thus far described, a movement of the carriage 23 in a direction across the axis of the rotatable work support carries the mandrel in a lateral direction. The pinion 32 being fixed on the shaft to rotate therewith and the rack 33 being fixed on the stationary base, the above movement will rotate the sleeve and the work supported by the mandrel.

In order to operate upon a cylindrical surface it is essential continuously to align the axes of the engraving tool and the mandrel or cylindrical object on which the copy is placed. The lateral movement in the direction across the axes gives the necessary rotation of the object, although any movement longitudinally of the mandrel or work support may be taken care of directly from the pantograph. Thus, the carriage 23 has an elongated slot 36 extending parallel with the longitudinal axis of the work support, the slot being provided with an arm 37 extending from the carriage 23 and secured preferably releasably thereon. The slot 36 is engaged by a pin 38 depending from the arm 16 of the pantograph. Any lateral movement of the pantograph machine is effective to move the carriage 23, but a longitudinal movement of the pantograph does not actuate the carriage because of its working in the elongated slot 36.

The end of the pin 28 is preferably ball shaped to minimize frictional resistance and the diameter of the ball-shaped head is substantially the size of the slot. Thus, any lateral movement of the pantograph in a direction across the axis of the rotatable work support is translated through the depending arm 28 to the carriage so that a rotatable movement of the work is had. Any movement longitudinally of the axis of the work support operates merely the engraving tool. Thus, the engraving tool accommodates longitudinal movement of the tracing point over the flat outline by a movement of itself, but a lateral movement across the outline is obtained by a movement of the work as the mandrel rotates to axially align the engraving tool therewith.

In order to support the weight of the pantograph with the motor mounted thereon and likewise to determine the depth that the engraving tool shall cut into the work, an adjustable pin 39 is mounted to depend from the arm 16 for engagement with the upper surface of a plate 40 mounted on the carriage 23. Since the movement of the carriage in a direction laterally of the axis of the work support is the same as the movement of the pantograph, the plate 40 needs be but little wider than the pin. However, the length of the plate 40 is considerably greater than the diameter of the pin since the pin must travel thereover a substantial area in order to accommodate the height of the copy.

While but a single embodiment of this invention is herein shown and described, it is to be understood that various modifications thereof may become apparent to those skilled in the art without departing from the spirit and scope of this invention and, therefore, the same is only to be limited by the scope of the prior art and the appended claims.

I claim:

1. In combination with a pantograph including a fixed point and linkage mechanism extending therefrom carrying a tracing point for moving over a flat outline and a second tracing point for making the desired copy on the work, a work support, a carriage on which said work support is rotatably mounted, means for positively connecting said pantograph and said carriage for movement of the latter in a direction transversely of the axis of said rotatable work support, and means between said carriage and said support to rotate the latter upon transverse movement of the former for continuous alignment of the axes of said support and said second tracing point.

2. In combination with a pantograph including a fixed point and linkage mechanism extending therefrom carrying a tracing point for moving over a flat outline and a second tracing point for making the desired copy on the work, a work support, a carriage on which said work support is rotatably mounted, a loose connection between said pantograph and said carriage for positive movement of the latter in a single direction transversely of the axis of said rotatable work support, and means between said carriage and said support to rotate the latter upon transverse movement of the former for continuous alignment of the axes of said support and said second tracing point.

3. In combination with a pantograph including a fixed point and linkage mechanism extending therefrom carrying a tracing point for moving over a flat outline and a second tracing point for making the desired copy on the work, a work support, a carriage on which said work support is rotatably mounted, a fixed pin extending from said pantograph for engaging a slot in said carriage extending parallel to the axes of said rotatable work support for moving the carriage in a single direction transversely of said axis, and means between said carriage and said support to

rotate the latter upon transverse movement of the former for continuous alignment of the axes of said support and said second tracing point.

4. In combination with a pantograph including a fixed point and linkage mechanism extending therefrom carrying a tracing point for moving over a flat outline and a second tracing point for making the desired copy on the work, a work support, a carriage on which said work support is rotatably mounted, means for positively connecting said pantograph and said carriage for movement of the latter in a direction transversely of the axis of said rotatable work support, a fixed rack, and a pinion engaging said rack and fixedly mounted on said rotatable work support, the movement of said carriage relatively to said fixed rack rotating said work support for continuous alignment of the axes of said support and said second tracing point.

5. In combination with a pantograph including a fixed point and linkage mechanism extending therefrom carrying a tracing point for moving over a flat outline and a second tracing point for making the desired copy on the work, a work support comprising a sleeve for removably receiving various mandrels in fixed relation therewith, a carriage in which said sleeve is removably mounted, means for positively connecting said pantograph and said carriage for movement of the latter in a direction transversely of the axis of said rotatable work support, a fixed rack, and a pinion engaging said rack and fixedly mounted on said sleeve, the movement of said carriage relatively to said fixed rack rotating said mandrel for continuous alignment of the axes of said mandrel and said second tracing point.

6. In combination with a pantograph including a fixed point and linkage mechanism extending therefrom carrying a tracing point for moving over a flat outline and an engraving tool for cutting the desired copy on the work, a work support, a carriage on which said work support is rotatably mounted, means for positively connecting said pantograph and said carriage for movement of the latter in a direction transversely of the axis of said rotatable work support, and means between said carriage and said support to rotate the latter upon transverse movement of the former for continuous alignment of the axes of said support and said engraving tool.

WILLIAM R. CUTHBERT.