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W. WHEELOCK

MACHINE FOR PRINTING METALLIC TAPE

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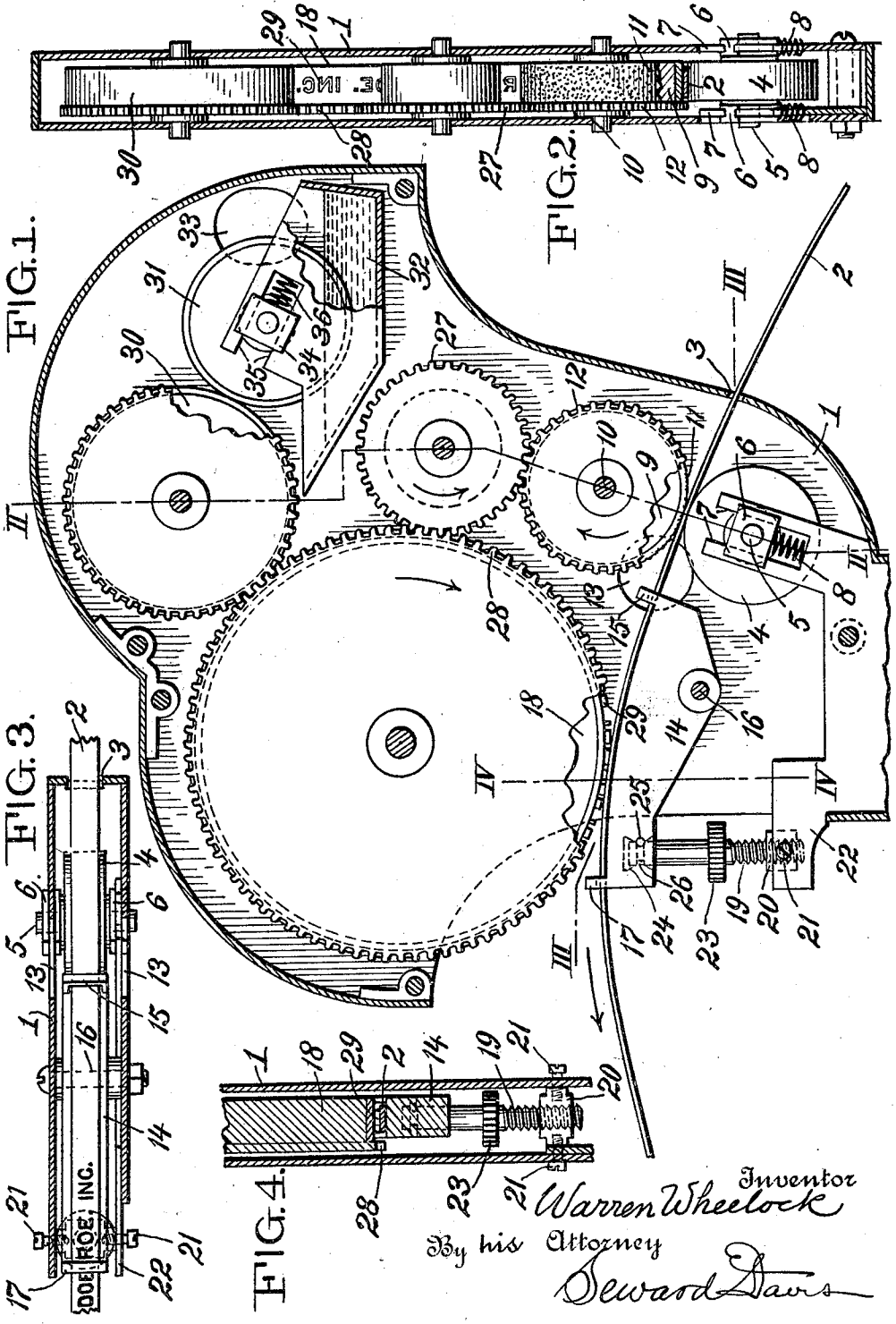

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MACHINE FOR PRINTING METALLIC TAPE.

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To all whom it may concern:

Be it known that I, WARREN WHEELOCK, a citizen of the United States, residing at 131 Macdougal Street, in the city, county, and State of New York, borough of Manhattan, have invented a Machine for Printing Metallic Tape of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates broadly to machines of the class adapted to print upon tape.

It has for its object the provision of a machine adapted to be driven directly through the medium of the tape itself as manually drawn therethrough.

It has for its particular object the provision in such a machine of means adapted to motivate the printing member indirectly by the tape-actuated driving means but independently of the contact between the printing member and the tape, whereby paper-covered flexible metallic tape may be printed upon continuously, clearly and accurately as it passes therethrough.

Paper-covered tape of flexible metal is adapted for use as a tie for large packages in lieu of cord and is largely so used in many retail establishments. These stores desire to take advantage of the advertising or identification possibilities afforded by an imprint upon the flat surface of such a securing means, and a demand has arisen for a device which will print the matter desired to be displayed continuously upon the tape as it is unwound from the carrying-spool or reel for wrapping and tying customers' packages. It has been found that metallic tape, by reason of its physical characteristics, presents difficulties not encountered in printing thin fabric or fibre tapes or ribbons directly from a rotating wheel whose periphery carries the printing characters. Among other difficulties which arise from or are due to the semi-rigid nature of metallic tape, is the necessity for insuring the fixity of the character to be printed relatively to the tape at the moment of impression, to avoid blurring or smearing, when the tape is pulled manually through the machine and in contact with the printing wheel.

This and other difficulties inherent in the problem of printing flexible metallic tape may be overcome by the means hereinafter described and illustrated in their preferential embodiment in the accompanying drawings, in which Figure 1 is a view in elevation of such machine, the cover being removed and certain parts being shown in section, the pedestal of the machine being indicated as broken away. Figure 2 is a sectional view of same upon line II—II of Figure 1. Figure 3 is a sectional view substantially at right angles to the plane of Figure 2, and shows the path of the tape. Figure 4 is a detail of Figure 1, showing the tape-adjusting means in a view at right angles to that of Figure 1.

Like reference numerals indicate the same parts throughout the several views, in which 1 is a casing, 2 the tape passing therethrough in the direction of the arrow, as drawn by hand at the exit side, from a reel or spool at the entrance side, not here shown. The tape enters the casing by the slot 3, and thence passes over the pressure roll 4 mounted upon an axle 5 journaled in a box 6 traveling between guides 7 and pressed upward by the spring 8, so that the roll is spring-pressed against the tape which passes between it and the roll 9 journaled at 10 in the casing and having a frictional surface 11 of emery cloth or the like, or other means of promoting engagement with the tape, as by milling. This roll has an offset toothed disc 12, integral therewith or fixed thereto, forming the driving gear to a train to be described. An opening 13 in the casing affords space for observation and threading of the tape through the tilting guide 14 having an upstanding slotted lug 15 through the slot in which the tape passes. The tape passes over the guide which is pivoted at 16 and through the slotted lug 17. Adjustment of the guide is secured relatively to the printing roll 18 by means of a screw-threaded stem 19 which engages a threaded collar 20 fixed by screws 21 in the extension 22 of the casing. The gnarled boss 23 affords means for lowering the guide to permit the introduction of the tape and for raising it until the tape is in printing position, the upper extremty of the stem 19 being rotatably held in the recess 24 in the guide by a pin 25 engaging an annular groove 26 in the stem. The roll 9 is driven by the frictional contact of the tape therewith, and in turn, through the medium of

the peripherally-toothed disc 12, drives the gear wheel 27 which engages the teeth 28 upon the printing roll 18. The printing roll has raised characters 29 about is periphery. The teeth 28 engage teeth upon the inking roll 30, whose periphery contacts with the characters 29 and also with the surface of the roll 31 which dips into the ink-well 32, access to which, for filling, being afforded by the casing-aperture 33. The roll 31 is mounted in a journal box 34 between guides 35 formed in the wall of the ink-box and is pressed into intimate contact with the inking-roll by the spring 36. The several gear wheels are journaled in the casing.

The operation of the device is such as to afford a friction drive by the contact of the tape with the friction roll carrying the first gear of the train; and by equalizing the pitch-diameter of the teeth of the gear to the line of drive of the friction roll, the rate of rotation of the printing roll becomes the same as that of the friction feed roll, which is identical in turn with the rate of movement of the tape. Similarly, the pitch diameter of the teeth of the gear associated with the printing roll is equal to the height of the printing characters. Thus the movement of the tape and printing characters is equal but relatively independent so far as mutual driving action is concerned, and the tape and characters contact on the radial lines of the printing roll, without frictional slip such as would otherwise be due to a tangential pull. By this arrangement, the printing roll is driven by the manual pull upon the tape, but independently of the direct contact of the tape therewith. Thus the effect of irregular stresses upon the tape to which it is subject in use is minimized, and when the tilting guide has been adjusted to afford the proper degree of pressure of the tape against the printing characters, which are preferably of resilient material, such as the rubber type commonly employed, a clear outline of the matter to be impressed is uniformly secured.

The machine is preferably rigidly mounted by means of its pedestal upon a table or the like support, to which it is secured. It is entirely encased by the bolting together of its casing-sections and requires no attention after initial adjustment.

Having thus described the preferred embodiment of my invention in such a clear manner that others skilled in the art to which it appertains can make and use the same, I claim:

1. In a tape-printing machine, the combination of a train of gear members, the first member of which is adapted to be frictionally driven by the tape to be printed, and the last member of which is adapted to print upon said tape, and an adjustable guide for said tape adapted to locate said tape relatively to the printing member.

2. In a tape-printing machine, the combination of a friction-roll, a pressure roll adapted to be pressed toward said friction roll, a printing roll adapted to be driven from said friction roll by an interposed gear wheel, and to drive an inking-roll adapted to contact with characters upon said printing-roll and with an ink-dipping-roll, a guide pivotally mounted adjacent said friction-roll and below said printing-roll, means adapted to position said guide, and means adapted to drive said friction roll by surface contact therewith.

3. In a tape-printing machine, a printing-roll having teeth whose pitch-line is at the level of the surface of its type, an idle-roll meshing therewith and with a third roll, the pitch-lines of the latter rolls being such that the rate of motion of the surface of the type is the same as that of the pitch line of the third roll, a driving means adapted to engage said third roll frictionally and consisting of a metallic tape, and means adapted to guide said tape into printing contact with said printing roll.

4. In a tape-printing machine, a train of toothed gears comprising an initial member having a cylindrical portion adjacent the teeth thereon adapted to engage a metallic tape, a spring-pressed roll adapted to urge said tape against such cylindrical portion, a guide adapted to receive said tape as it passes beyond said initial gear and to lead it into contact with printing characters upon a cylindrical portion of the final member of said train, and a gear intermediate said initial gear and said final gear adapted to mesh with both, and to maintain the direction of revolution of the initial and final gears without changing their velocity ratio, the planes of the pitch diameter of the teeth of the initial and final gears being so proportioned that the rate of circumferential motion of the printing characters always equals the rate of motion of the tape.

WARREN WHEELOCK.