June 27, 1961 R. HANSEN 2,990,001

ZINC PLATE FORMER

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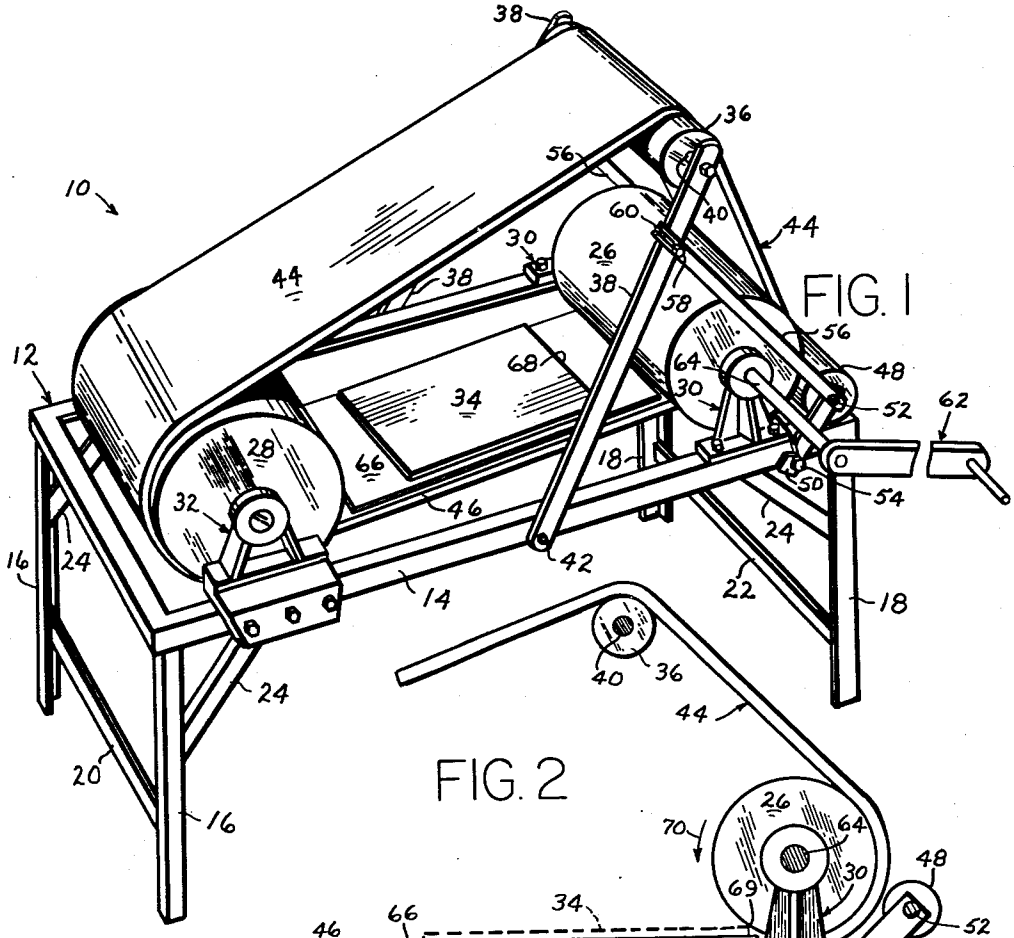
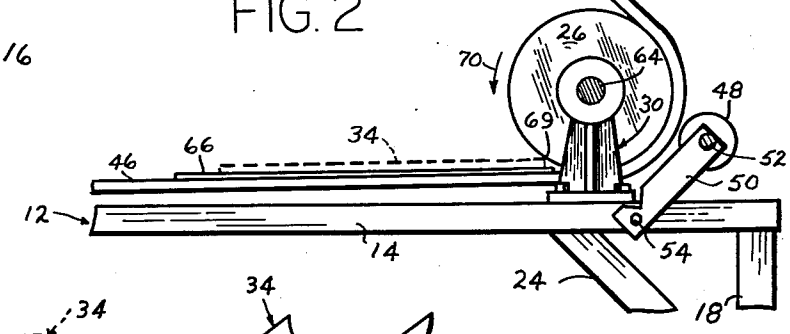


FIG. 2



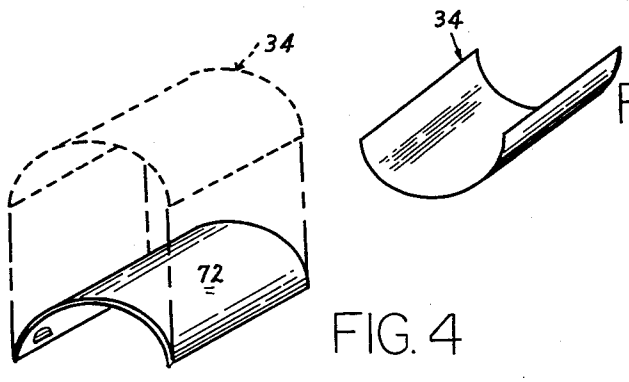


FIG. 3

FIG. 4

RICHARD HANSEN
INVENTOR.

BY Roya J. Miller

ATTORNEY

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ZINC PLATE FORMER

Richard Hansen, Oklahoma City, Okla., assignor to The Oklahoma Publishing Company, Oklahoma City, Okla., a corporation of Delaware

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The present invention relates to printing and more particularly to an apparatus for curving zinc printing plates.

It is conventional in newspaper printing, or the like, to form stereotype plates from matrices formed from the half-tone or line engravings and type locked in a chase. These stereotype plates are each arcuately curved to fit the press cylinder and rotate therewith in printing a continuous sheet. It is well understood that a certain amount of accuracy of reproduction of the engravings and type locked in the chase is lost by the mat and stereotype process, and that a much clearer impression may be obtained by direct printing from an engraving made from a slick proof of the type and wherein screen negatives are stripped into the negatives from which the engraving is made. Heretofore no satisfactory means has been developed for arcuately curving a zinc engraving and attaching the same to the rotary press cylinder.

These engraving plates, which are conventional, are formed from flat sensitized zinc plates which are substantially 60 thousandths of an inch in thickness. After printing the desired impression on the sensitized zinc the latter is etched to a depth of approximately 40 thousandths, from the sensitized or type surface, thus leaving a thickness of the zinc plate, between the type area and around half-tone impressions, of approximately 20 thousandths of an inch. Since the half-tone areas cannot be etched to such a depth, and still retain the half-tone screen, this results in a plate which is easily bent or deformed in the deep etched area but which is not easily formed or curved in those areas occupied by the half-tone screen. Furthermore, since this zinc plate is relatively thin when compared with the thickness of a stereotype casting the plate cannot directly replace the stereotype casting on a printing cylinder and still use the press in connection with such stereotype castings.

It is, therefore, the principal object of the instant invention to provide a novel portable apparatus for curving engraved printing plates for mounting and bonding the curved plates upon arcuate stereotype dummy plates to form a composite printing member in which the combined thickness of the printing plate and dummy plate is equal to the thickness of the usual stereotype cast printing plate.

Another object is to provide an apparatus of this class in which the composite printing member, comprising the printing plate and dummy plate, may be used interchangeably with cast stereotype plates now conventionally used with rotary printing presses.

Another important object is to provide a device of this class which will permit a rotary press to carry engraved plates and print directly upon a continuous sheet thereby producing a clearer and more accurate printing impression or reproduction of the engraving on the sheet stock.

Another object is to provide an apparatus of this class which is relatively simple in construction and economical in operation and which will accurately curve a zinc printing plate to a predetermined arc in one operation.

The present invention accomplishes these and other objects by providing a horizontally disposed, substantially rectangular frame which transversely journals a pair of drums in fixed spaced relation adjacent its respective opposing ends. A third drum is journaled in spaced-apart parallel relation above the pair of drums. An endless belt is tautly entrained over the three drums. A presser roller is freely journaled by one end of the frame in adjustably closely spaced relation with respect to one of said pair of drums. Handle means, connected with one of said pair of drums, permits rotating the drums and the belt for impinging a zinc plate between the belt and one of the drums.

Other objects will be apparent from the following description when taken in conjunction with the accompanying single sheet of drawings, wherein:

FIGURE 1 is a perspective view of the device;

FIGURE 2 is a fragmentary side elevational view of the zinc curving end portion of the apparatus with the bracing elements removed for clarity;

FIGURE 3 is a perspective view of the curved zinc plate; and,

FIGURE 4 is a perspective view of a stereotype dummy plate and illustrating, by dotted lines, the exploded position of the curved zinc plate before attachment with the dummy plate.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral **10** indicates the device, as a whole, which is substantially rectangular in general configuration. The numeral **12** indicates a frame formed from angle-iron stock, as shown, but which may be formed of any suitable material. The frame **12** includes a substantially rectangular horizontally disposed portion **14**, supported by two pairs of legs **16** and **18** suitably interconnected by cross members **20** and **22** and connected with the portion **14** by braces **24**. A pair of cylindrical-like hollow drums **26** and **28**, each having closed ends, are journaled transversely of the frame, adjacent its respective opposing ends by suitable bearing supports **30** and **32** connected with the respective sides of the horizontal portion **14** of the frame.

The radius of the drum **26** is preferably substantially equal with respect to the radius of the arc or curve desired for the finished zinc plate **34** for the reasons which will readily be apparent. The diameter of the drum **28** is not critical but is preferably equal to or greater than the diameter of the drum **26**, for providing ample work room or space between the drums for the purposes described hereinbelow.

The drums **26** and **28** are of substantially equal length and are preferably of greater length than the width of the zinc plate **34** to be curved. A third roller-like drum **36**, of any selected diameter and substantially of equal length with respect to the drums **26** and **28**, is journaled in spaced parallel relation above the drum **26** by a pair of braces **38** connected at one end to the respective ends of the drum shaft **40** and pivotally connected at their opposite ends with the horizontal portion **14** of the frame by bolts **42**.

An endless belt **44**, having a width slightly less than the length of the drums but greater than the width of the zinc plate **34**, is tautly entrained around the three drums **26**, **28** and **36**, thus providing a substantially horizontally disposed extent **46**, of the belt, between the pair of drums **26** and **28** for the purposes more fully disclosed hereinbelow.

A cylindrical-like presser roller **48**, diametrically smaller than the drum **26** is freely journaled in parallel closely spaced relation with respect to the drum **26**, adjacent the outer surface of the belt **44** by a pair of upwardly inclined supports **50**, each connected at one end with the shaft **52** of the roller **48** and pivotally connected at their opposing ends to the respective sides of the frame portion **14** by bolts **54**.

A pair of struts **56** are each connected at one end to the

roller shaft **52** and are adjustably connected adjacent their respective opposing ends to the braces **38**, intermediate their ends, by bolts **58**. The ends of the struts **56**, connected with the braces **38**, are each provided with a longitudinal slot **60** which permits adjustably positioning the roller **48** adjacent the belt **44** for the purposes which will presently be apparent.

Handle means **62** is connected with the shaft **64** of the roller **26** for manually rotating the latter and the belt **44**.

Operation

In operation, suitable flat padding **66** is positioned on the horizontal portion or extent **46** of the belt between the drums **26** and **28**. The rectangular flat zinc engraving **34** is placed, type face or impression side down, upon the upper surface of the padding **66**. The leading edge **68** of the zinc plate is manually positioned in contiguous contact with the periphery of the drum **26** as at **69** (FIG. 2). Placing the edge **68** of the plate **34** in contact with the drum **26** prior to the start of the bonding or curving action, insures that the axis of the curve imparted to the zinc plate will be coaxial with respect to a press printing roller, not shown. The drum **26** is then manually rotated by the handle means **62**, in the direction of the arrow **70**, thus moving the zinc plate **34** and padding **66** around the circumference of the drum **26** which arcuately curves the zinc plate **34**. The combined thickness of the plate **34** and padding **66** forces the belt **44** outwardly of the periphery of the drum **26** and contacts the periphery of the fixed presser roller **48**. Thus, the presser roller **48** maintains the zinc plate in contiguous rolling contact with the periphery of the drum **26** and insures imparting a curvature to the plate **34** substantially equal with respect to the radius of the drum **26**. The purpose of the padding **66** is to prevent damage to raised type face or half-tone impressions on the printing face of the zinc plate by the pressure of the roller **48**. After the zinc plate **34** has been rolled around the circumferential portion of the drum **26**, the plate **34** is removed from the drum and has a configuration substantially like that shown in FIG. 3. A stereotype blank dummy plate or saddle **72**, adapted to be connected in a conventional manner to the printing roller of a press, not shown, is provided for each of the curved zinc plates **34**. The curved zinc plate is positioned upon the outer surface of the dummy plate **72**, as shown by the dotted line action in FIG. 4, and is securely fastened thereto by a bonding agent applied to the meeting surfaces of the plate **34** and dummy plate **72** thus forming a composite printing member having the identical thickness of a conventional stereotype cast printing plate which may then be removably connected to printing rollers of presses, not shown.

Obviously the curved zinc plate **34** is tested by placing the latter in position upon the dummy plate **72** before applying the bonding agent to insure a perfect fit between the mating surfaces. If the zinc plate **34** has not been perfectly curved it is again placed upon the device and rolled, back and forth, around the drum **26** and retested on the dummy plate **72** until the desired fit is obtained.

Obviously the invention is susceptible to some change or alteration without defeating its practicability, and I therefore do not wish to be confined to the preferred embodiment shown in the drawings and described herein, further than I am limited by the scope of the appended claims.

I claim:

1. An apparatus for arcuately curving a zinc plate, comprising: a horizontally disposed rectangular frame; a pair of drums journaled by horizontal axles connected transversely to said frame adjacent the respective ends of the latter; a pair of braces connected at one end to opposing sides of said frame intermediate its ends; a third drum journaled by a horizontal axle extending between and connected to the other ends of said braces above said frame in adjustable spaced parallel relation with respect to the axis of said pair of drums; an endless belt tautly entrained over said pair of drums and said third drum and forming a substantially horizontal extent extending between said pair of drums adapted to position and support a zinc plate to be curved; a pair of supports connected to said frame adjacent one of said pair of drums; a presser roll freely journaled by a horizontal axle extending between and connected to said supports positioning a peripheral portion of said presser roll in adjustable closely spaced relation with respect to a peripheral portion of one of said pair of drums; and handle means for rotating one of said pair of drums and said endless belt for impinging a zinc plate positioned on the horizontal extent of said belt between the latter and the periphery of one of said pair of drums as the belt and drums are rotated.

2. An apparatus for imparting a predetermined curve to a zinc plate, comprising: a horizontally disposed rectangular frame; a pair of drums transversely journaled above said frame adjacent the respective ends of the latter, at least one of said drums having a radius substantially equal to the radius of the curve desired for said zinc plate; a pair of elongated upstanding braces pivotally connected at one end to the respective sides of said frame intermediate its ends. a third drum journaled between the upper end portions of said braces above said frame in adjustable spaced parallel relation with respect to said pair of drums; an endless belt tautly entrained over said pair of drums and said third drum and forming a substantially horizontal extent extending between said pair of drums adapted to position and support a zinc plate to be curved; a pair of supports connected to the respective sides of said frame adjacent said drum having a radius substantially equal to the radius of the curve desired for said zinc plate; a presser roll having an axle connected to said supports positioning a peripheral portion of said presser roll in closely spaced relation with respect to a peripheral portion of said one of said pair of drums having a radius substantially equal to the radius of the curve desired for said zinc plate; a pair of elongated strut members connected at one end to the respective opposing end portions of the axle of said third drum and adjustably connected at their other end portions to said outstanding braces intermediate the ends of the latter for preventing movement of said third drum toward said presser roll; and handle means for rotating the last mentioned said drum and impinging a zinc plate between the belt and the drum for curving the zinc plate around the drum, whereby said presser roll bearing against the outer surface of said belt maintains a rolling contact between the zinc plate and the periphery of the drum.

References Cited in the file of this patent

UNITED STATES PATENTS

608,706	Osborne	Aug. 9, 1898
1,126,982	Goss	Feb. 2, 1915
2,309,963	Krueger	Feb. 2, 1943
2,815,779	Higgens	Dec. 10, 1957