Sept. 8, 1953 G. W. BUNGAY 2,651,614

ELECTROTYPER'S CASE

Filed Dec. 16, 1949

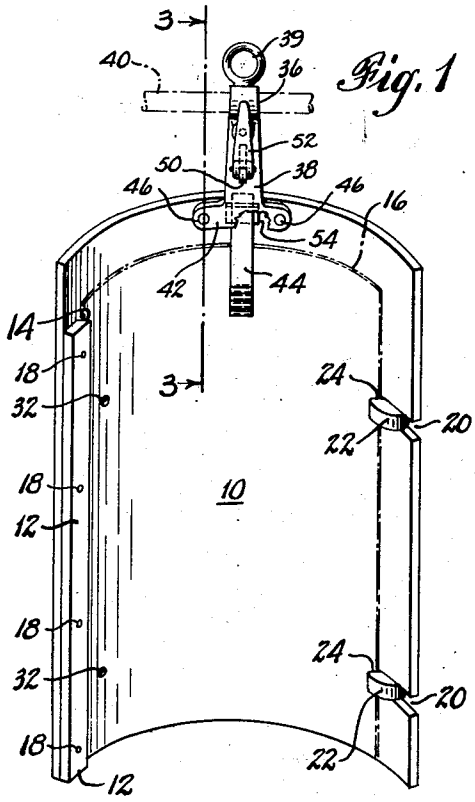

Fig. 1

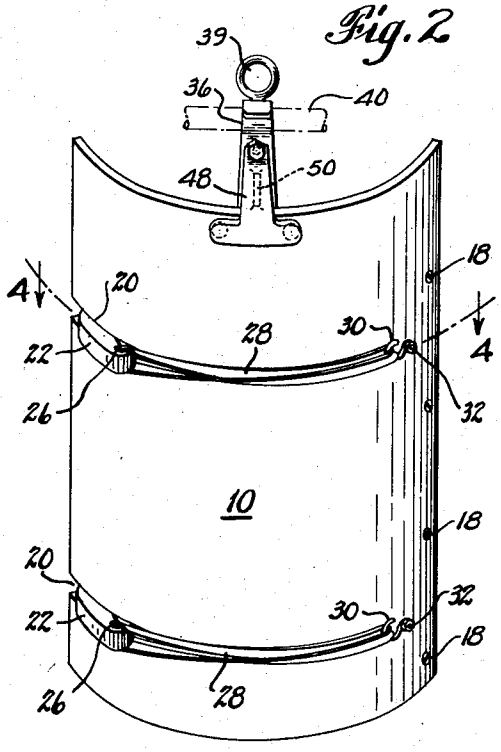

Fig. 2

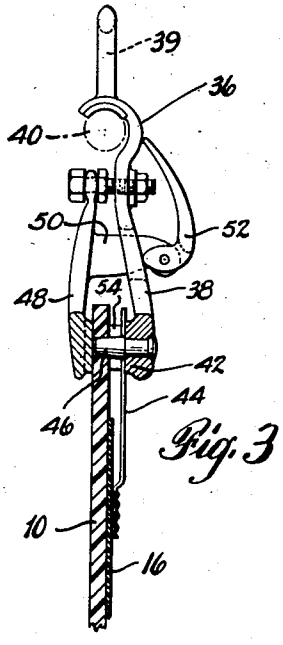

Fig. 3

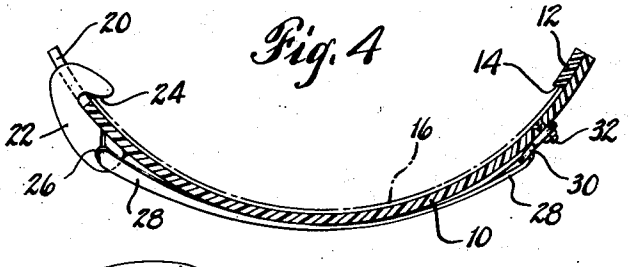

Fig. 4

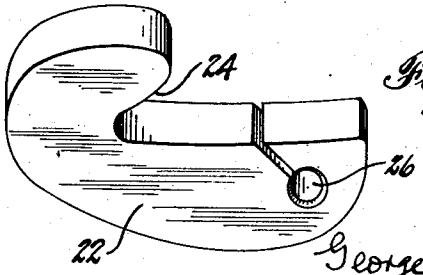

Fig. 5

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Patented Sept. 8, 1953

2,651,614

UNITED STATES PATENT OFFICE

2,651,614

ELECTROTYPER'S CASE

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Application December 16, 1949, Serial No. 133,345

3 Claims. (Cl. 204—297)

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The present invention relates to a novel and improved electrotyper's case for the electrodeposition of curved shells.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a front perspective view of a typical and illustrative embodiment of the present invention.

Figure 2 is a rear perspective view of the parts shown in Figure 1.

Figure 3 is a detailed vertical section taken on the line 3—3 of Figure 1.

Figure 4 is a cross sectional view taken on the line 4—4 of Figure 2; and

Figure 5 is a detailed perspective view of one of the hooks shown also in Figures 1, 2 and 3.

The present invention has for its object the provision of an improved curved electrotyper's case for the formation of shells for curved or arcuate printing plates which will be properly registered when they are completed ready for printing. A further object is the provision of a case which will hold the molds accurately to the desired curvature during the electrodeposition operation and thereby reduce the amount of correction needed on the shell when it is backed. The invention further provides a curved case which securely holds the electrotyping mold with a minimum of parts and which can be simply and rapidly loaded with the mold to be plated.

The present invention finds its greatest field of usefulness in the production of electrotype shells for arcuate printing plates which are to be backed while they are still in the curved condition. During the backing operation several of the shells may be joined together to form a cylinder which is supported in a suitable casting mold and rapidly rotated while the molten metal is poured onto the back of the shells so that the backing metal congeals while it is subjected to relatively

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great centrifugal force. The principal cause of incorrect register in a curved plate, uneven stretching of the plate as it is bent from a flat plate to a curved plate, is thus completely avoided inasmuch as the curvature of the finished plate is at least substantially the same as the curvature of the shell as it is deposited. The mold may be of material which is sufficiently thin so that the change in register on the face of the mold from its flat condition, as molded, to its curved condition, as used for deposition, is almost negligible and in any event is uniform.

The electrotype molds for the production of printing plates are preferably formed of a relatively thin sheet of some thermoplastic resinous material, such as a flexible and tough sheet of a copolymer of vinyl acetate and vinyl chloride of substantial thickness and preferably from about .030 to about .100 inch thick. These molds are relatively smooth on one side and on the other side bear the accurately molded matrix reproduction of the letterpress or relief printing plate to be reproduced by electrotyping. The matrix, or design-bearing face of the thermoplastic sheet is provided with a thin film of silver or other conductive material and is then subjected to the conventional process of electrodeposition, in which a substantial layer of copper, oftentimes about .020" in thickness is deposited on the layer of silver so as to form the shell which is later to be backed up with the usual lead alloy as a backing metal. The deposition of the copper on the conductive layer of the mold may be preceded, if desired, by the deposition of a thin flash layer of a more durable metal, such as nickel. The curvature of the mold while it is being subjected to electrodeposition is preferably approximately the same as the curvature to which the finished plate is to be formed for printing. Thus, the molds for the shells which are to form printing plates to be printed on cylinders of from 14.0 to 16.0 inches diameter may be plated while curved to a diameter of about 15.0 inches. Thus the total register error when curved to 14.0 or 16.0 inches will not ordinarily exceed 0.014", or less than the screen width of one line of a 100 line screen, when the error is uniformly distributed along the length of the plate. Such an error is indistinguishable in even the finest quality of printing, unless the print is examined microscopically. Furthermore, this error is substantially constant for the several plates of a color-set, whereas the curving of backed, flat color plates is often the principal

cause of their being seriously out of register, often to an extent sufficient to render them unusable.

In accordance with the present invention, there is provided an arcuate, or parti-cylindrical rigid supporting member or rigid sheet having a mold retaining member along one of its axially extending edges, with a plurality of hooks or clamps along another of its edges, the concave surface of the case being adapted to receive a mold which is resiliently urged against the concave surface by the arcuately movable clamps. Suitable means are provided for forming electrical connection with the silver-plated surface of the mold, while the clamps not only hold the mold against slipping vertically on the case while suspended in the plating bath, but also serve to hold the mold firmly against the concave side of the case and to conform the mold accurately to the concave curvature of the mold, thereby minimizing the corrective work which would otherwise be necessary at a later stage on the deposited shell or the finished plate.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the illustrative embodiment of the present invention, the drawing shows a typical and illustrative embodiment of the invention as applied to the production of parti-cylindrical electrodeposited shells which may be as small as a quarter-cylinder or less, or may be as long as a full cylinder, in which latter event, the diameter of the mold during the plating operation would be very slightly larger than the diameter of the printing plates to be formed from the shells plated on the molds.

The case, as illustrated, comprises a relatively heavy supporting sheet of insulating material **10** which is relatively tough and rigid and is not subject to attack by the components of the plating baths. For this purpose, the sheet **10** may be formed of heavy phenolic-aldehyde condensation resin or of heavy copolymer of vinyl acetate and vinyl chloride so as to provide a portion of a cylinder which has sufficient rigidity, stability and mechanical strength to maintain the desired degree of curvature. In most instances the sheet **10** will be slightly longer than one-quarter circumference, and of a height sufficient to receive the largest size of plate to be deposited. Thus, for a plate to be 10" by 15" in size and curved about its 10" length as a quadrant of a 13" diameter cylinder, the case would be about 18" high and have an arcuate surface of about 12 or 13". For such a case, its thickness should be about 0.25" to 0.35" to provide the desired degree of rigidity and stability.

Along one straight edge of the curved sheet **10** and on its concave side is secured a strip of similar rigid plastic material **12**, one edge **14** of which is bevelled so as to receive the edge of the mold **16** which is to be positioned against the concave side of the support **10**. Bevelled strip **12** is secured to the support **10** by any desired means, such as the stainless steel screws **18** which pass through the sheet **10** and are threaded into the strip **12**.

For urging the mold into a concave shape against and conforming to the concave face of the sheet **10**, and for pressing the mold against the bevelled strip **12**, means are provided for engaging and resiliently urging the mold along its opposite edge. For this purpose the sheet **10** is provided with two relatively deep slots **20** near its edge opposite the strip **12** and extending at right angles to the strip **12**. In each of these slots is positioned a clamp or hook member **22** having a bevelled face **24** and a slotted hole **26**, the bevelled face being adapted to project through the slot **20** and to engage with an edge of the mold **16**. For resiliently urging the hooks **22** towards the strip **12**, any desired spring means may be used, and in the preferred embodiment these comprise the long rubber bands **28** which are connected between the hole **26** on one hook and a wire hook **30** held to the rear face of the sheet **10** by means of the screw **32**. The screws **32**, the hooks **30** and the screws **18** are formed of the same material which is not readily attacked by the plating baths, and for this purpose the submerged metal parts may be stainless steel.

Figure 4 illustrates the position of a mold **16** as it is clamped between the bevelled strip **12** and the hooks **22** under the resilient clamping pressure of the rubber bands **28** thereby conforming the mold to the concave shape of the inner face of the case, so that the shell which will be deposited thereon will be substantially the current curvature for the eventual printing plate being made.

As embodied, there is provided a clamping hook **36** comprising a conducting member **38** formed at its upper end with a finger hole **39** for lifting the hook and case and a concave saddle for sup porting the hook and case on the bus bar **40**, electrically connecting the hook and mold thereto. At its lower end member **38** is formed with a connecting pad **42** to make electrical connection with the metal strip **44** attached as usual to the silvered face of the mold and also with tapered pins **46** to pass through holes in the case **10** and mechanically connect the hook and case together. For forcing the pad **42** against the metal strips **44** toggle means are provided comprising a pivoted clamping member **48**, a tongue **50** and a rotatable pressure member **52**.

Figure 3 shows the toggle means in clamping position with the metal strips **44** supported on a rubber pad **54** which is conveniently cemented to a case.

After the shell has been formed on the mold and the desired thickness of metal has been deposited, the shell and mold are removed from the case by releasing the hooks **22** and by releasing the strip **44** from the shell and mold. During this operation the hooks **22** may be engaged over the edge of the sheet **10** so as to keep them from interfering with removal of the mold and shell.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. A curved electrotyper's case comprising a supporting member having a cylindrical concave face, a curved top edge lying substantially in a plane transverse to the axis of curvature of said face, and side edges, said supporting member provided with spaced parallel slots along one side edge thereof and in transverse relationship to the side edge of said supporting member, a hook fastened adjacent said curved top edge of said supporting member for supporting and electrically connecting the case in an upright position, rigidly fixed holding means secured along one side edge of said supporting member and parallel to

the cylindrical axis for engaging one of the straight edges of a flexible mold on the concave face of the supporting member, releasable, resiliently urged hooks projecting through said slots in said supporting member for engaging the other and parallel straight edge of the mold at spaced alined points for securing the mold on said member and for conforming the mold to the concave face, and tension members on the convex side of the supporting member for urging said hooks into tight engagement with one of the side edges of a flexible mold.

2. A curved electrotyper's case comprising a supporting member having a cylindrical concave face, a curved top edge lying substantially in a plane transverse to the axis of curvature of said face, and side edges, said supporting member provided with spaced parallel slots along one side edge thereof and in transverse relationship to the side edge of said supporting member, a hook fastened adjacent said curved top edge of said supporting member for supporting and electrically connecting the case in an upright position, rigidly fixed holding means secured along one side edge of said supporting member and parallel to the cylindrical axis for engaging one of the straight edges of a flexible mold on the concave face of the supporting member, said holding means having the plate engaging portion thereof bevelled to receive the edge of the mold, releasable, resiliently urged hooks projecting through said slots in said supporting member for engaging the other and parallel straight edge of the mold at spaced alined points for securing the mold on said member and for conforming the mold to the concave face, said hooks provided with bevelled edges opposite to the bevelled edges of said holding means, and rubber bands mounted on the convex side of the supporting member and secured

to said hooks for urging the hooks into tight engagement with one of the side edges of a flexible mold.

3. A curved electrotyper's case comprising a supporting member having a cylindrical concave face, a curved top edge lying substantially in a plane transverse to the axis of curvature of said face, and side edges, a hook fastened adjacent said curved top edge of said supporting member for supporting and electrically connecting the case in an upright position, rigidly fixed holding means secured along one side edge of said supporting member and on said concave face and parallel to the cylindrical axis for engaging one of the straight edges of a flexible mold on the concave face of the supporting member and a plurality of releasable hook means each resiliently urged to move in separate planes transverse to the axis of curvature and along said concave face and positioned along the opposite side edge of the supporting member and on the concave face for engaging the other and parallel straight edge of the mold at spaced alined points for securing the mold on said member and for conforming the mold to the concave face.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
23,836	Elliot	May 3, 1859
893,659	Satterlee	July 21, 1908
1,350,758	Welsh	Aug. 24, 1920
1,534,918	Claybourn	Apr. 21, 1925
1,747,165	Eaton	Feb. 18, 1930
2,074,335	Kelley	Mar. 23, 1937
2,190,440	Beebe	Feb. 13, 1940
2,350,993	Aigner	June 13, 1944