

June 12, 1923.

1,458,477

W. GAMBLE ET AL

METHOD FOR APPLYING SHEETS TO PRINTING CYLINDERS

Filed Sept. 8, 1922

2 Sheets-Sheet 1

FIG. 1.

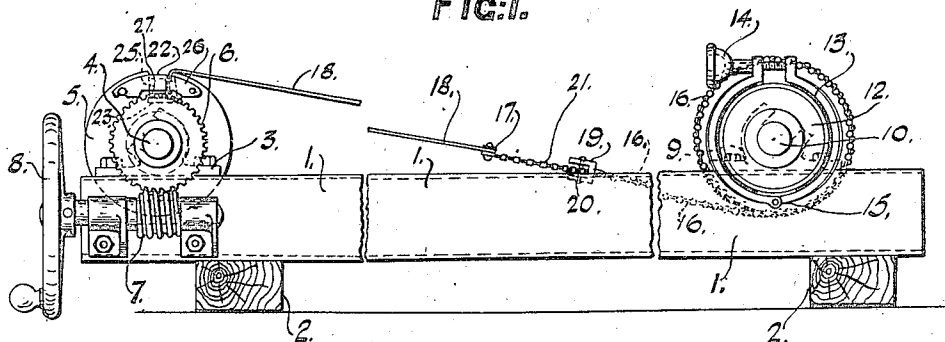
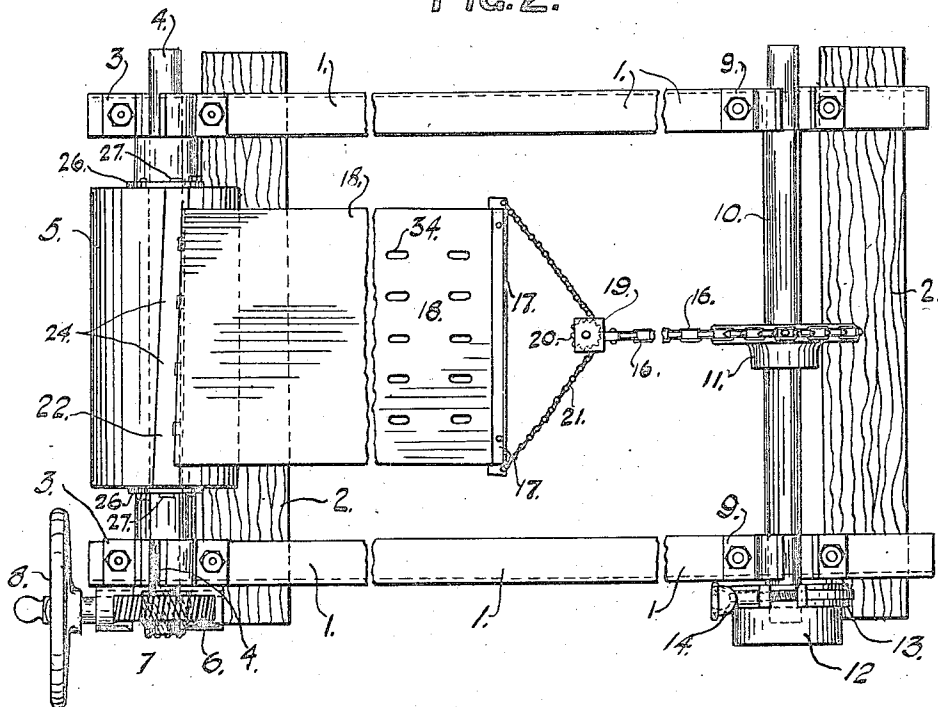


FIG. 2.



W. GAMBLE AND M. OWEN

INVENTORS

PER: Sydney E. Taggart
ATTORNEY

June 12, 1923.

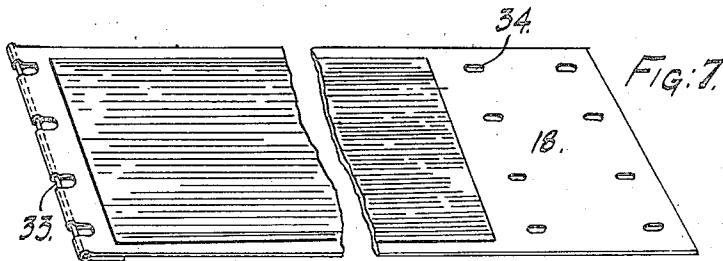
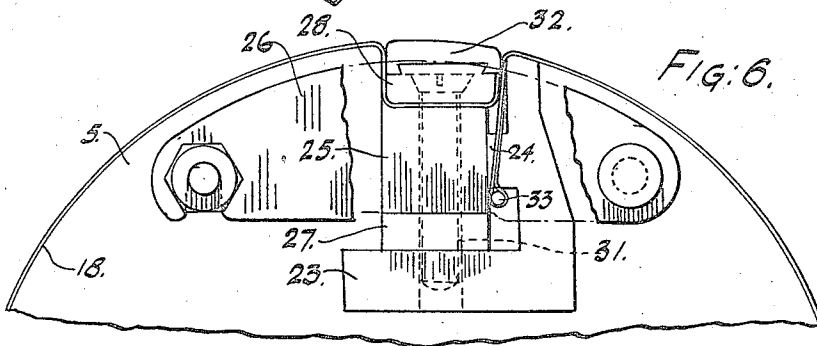
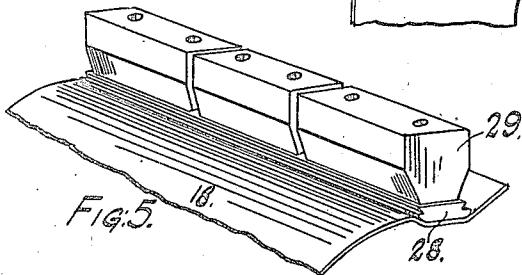
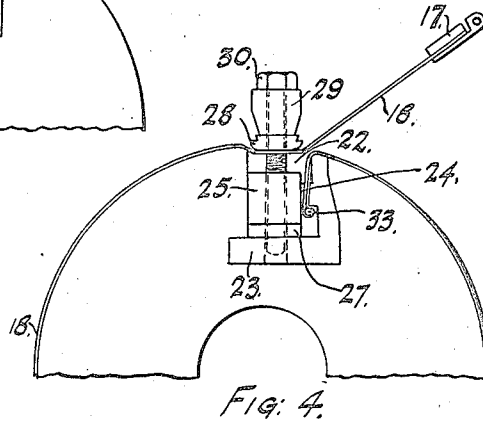
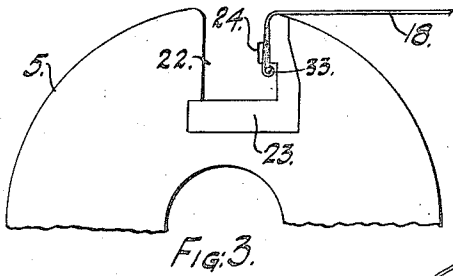
1,458,477

W. GAMBLE ET AL

METHOD FOR APPLYING SHEETS TO PRINTING CYLINDERS

Filed Sept. 8, 1922

2 Sheets-Sheet 2



W. GAMBLE AND M. OWEN.
INVENTORS.
PER Sydney C. Page.
ATTORNEY.

Patented June 12, 1923.

1,458,477

UNITED STATES PATENT OFFICE.

WILLIAM GAMBLE AND MALCOLM OWEN, OF LONDON, ENGLAND, SAID GAMBLE
ASSIGNOR TO A. W. PENROSE AND COMPANY LIMITED, OF LONDON, ENGLAND.

METHOD FOR APPLYING SHEETS TO PRINTING CYLINDERS.

Application filed September 8, 1922. Serial No. 587,014.

To all whom it may concern:

Be it known that we, WILLIAM GAMBLE and MALCOLM OWEN, both subjects of the King of Great Britain, residing at London, England, have invented a Method for Applying Sheets to Printing Cylinders, of which the following is a specification.

This invention relates to methods of applying relatively thin sheets to cylindrical surfaces used in the printing art, more particularly for wrapping thin etched sheets of metal on cylinders for intaglio and photo-gravure printing.

The main object is to obtain a firm and even surface on the sheet after wrapping has been effected, so that the best printing results are obtainable and especially so that sheets may be removed and replaced on cylinders so that they can be kept for further work if desired.

In the accompanying drawings are illustrated preferred constructions embodying the present invention:

Fig. 1 is a side elevation of the tension apparatus;

Fig. 2 is a plan of the tension apparatus;

Fig. 3 is an end view of a printing cylinder constructed according to the present invention showing the method of providing pegs for attaching the sheet, and the initial position of the sheet for a wrapping operation;

Fig. 4 is a similar view to Fig. 3 showing the position of the parts at the final movement of the wrapping operation and at the beginning of the final clamping of the sheet;

Fig. 5 is a detail view showing the presser members, hereinafter referred to, associated with a dove-tailed base portion of the clamping piece;

Fig. 6 is a similar view to Figs. 3 and 4 showing the wrapping and fixing operations completed;

Fig. 7 is a pictorial view of an etched sheet constructed according to the present invention.

Referring first to Figs. 1 and 2 of the drawings, the numerals 1 and 2 indicate longitudinal and transverse members of a framework, at one end of which is disposed on the longitudinals, bearings 3 for the reception of a spindle 4 adapted to carry a printing cylinder, indicated by the numeral 5. The bearings are open at the top so that the spindle may be immediately removed, if

required, by lifting it from the bearings.

On the spindle at one end, outside a bearing 3, is fixed a worm wheel 6, and fitted on the adjacent longitudinal is a worm 7, adapted to be operated by any means, such, for instance, as the handle 8.

At the other end of the framework, bearings 9 are arranged on the longitudinals in the same manner as the bearings 3, the bearings 9 also being preferably open for the direct reception of a spindle 10, on which is mounted a sprocket wheel 11 arranged centrally of the frame. At one end of the spindle 10 is mounted a brake drum 12, about which is fitted a friction device 13, which may be adjustable about the drum by means of the device 14, the segments of the braking device being pivotally connected, as indicated at 15, to an adjacent portion of a longitudinal member 1. The rotation of the member 14 causes the segments of the device 13 to move about their pivots in order to vary the frictional engagement with the drum 12. Fixed near the periphery of the sprocket wheel 11 is a chain 16 which is adapted to wrap round the sprocket wheel, and which carries at its free end a clamping element 17 for attachment of a sheet 18 intended to be wound around the printing cylinder 5. In order to maintain the clamping bar parallel with the axis 10, the clamping bar is connected to the chain 16 by means of a block 19 carrying a toothed wheel 20, over which passes a second chain or other flexible member 21, connected to both ends of the clamping bar.

In use, one end of the sheet 18 is fitted to the usual gap 22 formed in the printing cylinder, and the other end is attached to the clamping bar 17. The sprocket wheel is then rotated to coil the chain around it until the sheet 18 is pulled out and strained under tension. The braking device is then applied until it prevents any reverse rotation of the spindle 10 which would slacken the tension in the sheet. Due to the position of the bearings one to another on the platform, the sheet, when so strained, is disposed tangentially to the periphery of the cylinder 5, then to wrap the sheet around the cylinder 5, the worm 7 is rotated, and by gearing with the worm wheel 6, causes the cylinder 5 mounted on the spindle 4 to be rotated away from the tensioning device and to wrap the sheet

around it, while the tension applied to the sheet is maintained.

It may here be pointed out that the worm 7 prevents a reverse rotation of the cylinder 5 which the tension of the sheet tends to effect. The sheet having been wrapped entirely round the cylinder until its end attached to the clamping bar 17 overlaps the gap 22 in the cylinder, that end of the sheet is then fixed within the gap and the clamping bar released from the sheet, when any extra material may be removed.

Other applications of this part of the invention will be apparent to those engaged in the printing art. For instance, the method may be used to wrap cylinders with the rubber sheets by which "off-set" printing is accomplished, and it may also be applied to the clothing of ordinary printing cylinders with felts or blankets, if found desirable, although it is evident that neither tension nor evenness of the same degree is needed in this latter case.

Though described with reference to metallic sheets, which would be the ordinary application, the invention may also be used for the application of other materials of relatively thin character, for instance, for printing from celluloid sheets, or for attaching these and such like materials for other purposes.

Now in order to provide a cylinder especially adapted for the reception of the end of a sheet before tension is applied and for fixing the sheet when it is wrapped around the cylinder, and further, provide a sheet especially adapted to be subjected to tension, we construct the cylinder, its parts, and the sheet as now to be described with reference to Figs. 3 to 7 of the accompanying drawings.

The slot or gap 22 of the cylinder is provided with a steel reinforced jaw 23, the jaw carrying pegs 24 for attachment of the etched sheet 18. The sheet is anchored to the pegs 24 and tension is applied as already described, the cylinder being rotated until the other end of the sheet overlies the gap 22.

However, to prevent detachment of the sheet from the pegs 24 during rotation of the cylinder, a distance piece 25 is inserted in the slot 22 and on the jaw 23. Then in order to prevent the distance piece 25 moving, latches 26 are arranged at each end of the cylinder which engage over lugs 27 of the distance piece, as will be readily understood. (These latches are omitted from Fig. 4 for sake of clearness.) The sheet having been wrapped around the cylinder to the position shown in Fig. 4 a base portion 28 of a capping piece is placed over the sheet associated with a sectional presser member, indicated by the reference numeral 29. The presser member 29 and

the base portion 28 are then thrust into the slot by rotating bolts 30 which extend through the sections of the presser member, the base portion 28 of the capping piece, the sheet 18, the distance piece 25, and the jaw 23 within the slot, thereby firmly clamping the free end of the sheet against the distance piece. In this final position the dove-tailed base portion 28 is tightly engaging the distance piece 25, holding the free end of the sheet sandwiched therebetween. The final position having been reached the sections of the presser member 29 are removed one by one, and the bolts 30 are replaced by shorter bolts 31 having their heads countersunk on the base portion 28 of the capping piece. Then in order to cover the heads and to fill the slot of the cylinder an undercut top portion of the capping piece, indicated by the numeral 32 is slid over the base portion 28, as will be clearly understood by reference to Fig. 6.

In such construction the distance piece and capping piece will preferably be so dimensioned that the outer face of the capping piece lies substantially in the peripheral circle of the cylinder; it may, however, be a little higher, or a little lower, without causing trouble.

In order that the printing sheet 18 may withstand the tension applied for the wrapping operation and also be suitable for the final clamping operation referred to, it is provided at each end with perforations as shown in Fig. 7, and one or both ends are reinforced, for instance, by rolling them over a rod 33. The loops so formed may be made a fixture in any suitable manner, for instance, by soldering or rivetting, but it is not essential that such a fixture should be made.

In operation, the rod 33 will lie immediately below the pegs 24, and further will take and distribute the effort on the sheets and tearing will be avoided. The other end of the sheet may be similarly formed so that the clamping member 17 has a good gripping surface, but in any case the row of perforations 34 will be included as they are necessary for the passage of the bolts 30 or 31.

The final clamping operation having been effected, the free end of the sheet 18 is scored along the edge of the capping piece and fractured by bending it to and fro, and it will be noted that the end of the sheet so fixed will have been passed down one side of the capping piece within the slot sandwiched between the capping piece and the distance piece, and will extend upwardly between the other side of the capping piece and the slot.

The construction just described is applicable when the slot on the printing cylinder is oblique to the axis, as shown in Fig. 2 of

the drawings. When the slot is oblique the angle is such that the doctor is always provided with a supporting surface while passing over a joint between the copper surface and the capping piece.

The rake of the slot in the printing cylinder is preferably not less than one inch in ninety-six inches.

It should be particularly noted that by the manner of fixing the printing sheet comprised in the present invention, only a narrow slit in the cylinder is necessary.

By the use of an oblique slot any clicking noise whilst performing the wiper is substantially eliminated. Further, the doctor is maintained at a constant pressure while passing over a joint due to its narrow character and to the fact that the doctor is carried by the second half of the rake before leaving the first, thus obtaining a clean wipe at every impression.

When an oblique slot is formed in the periphery of the cylinder, thereby giving efficient support to the doctor as it passes over a joint, the doctor need not be supported by a capping piece having its outer face level with the periphery of the cylinder, as the rising of the doctor from a lower level would be gradual. Further also, the usual mechanism for reciprocating the doctor and for pressing the doctor on to the cylinder may be retained.

By our invention we provide a simple and effective means for securing a sheet on a printing roller, and improve the roller and the sheet, whether the sheet is to be made of copper, zinc, rubber, celluloid, hardened gelatine, or other known material utilized for printing surfaces.

We claim:—

1. A method of applying sheets for use as a printing surface to printing cylinders,

wherein one end of the sheet is attached on one side of the gap of the cylinder and the sheet is stressed mechanically under tension tangentially to the cylindrical surface, the cylinder being held against rotation during the initial straining and then while the strain is maintained, rotated to wrap the sheet tightly around it, whereon the other end of the sheet is fixed within the gap aforesaid.

2. A method of applying sheets for use as a printing surface to printing cylinders, wherein one end of the sheet is attached on one side of the gap of the cylinder and the sheet is stressed mechanically under tension tangentially to the cylindrical surface, the cylinder being held against rotation during the initial straining and then while the strain is maintained, rotated to wrap the sheet tightly around it, whereon the other end of the sheet is pressed into the gap while the tension is maintained and thereafter fixed.

3. A method of applying sheets for use as a printing surface to printing cylinders, wherein one end of the sheet is attached on one side of the gap of the cylinder and the sheet is stressed mechanically under tension tangentially to the cylindrical surface, the cylinder being held against rotation during the initial straining and then while the strain is maintained, rotated to wrap the sheet tightly around it, whereon the other end of the sheet is pressed into the gap, the end being then fixed in sections while pressure is retained on the end and the tension maintained.

In testimony whereof we affix our signatures.

WILLIAM GAMBLE.
MALCOLM OWEN.