MAGNETIC PRINTING PLATE HOLDOWN MEANS


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2 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to a magnetic printing plate holdown means and method. The invention is practiced with plate cylinders having a plurality of annular magnetic discs for attaching a metal back printing plate in conforming relation to the cylinder surface. The cylinder surface is equipped with an elongated axially-extending groove in which the ends of the printing plate are received and are clamped in immobile relation by means of a retainer bar contoured to fit the groove.

When a metal back printing plate is made with a thin backing (0.0065"-0.010"), the metal becomes saturated with magnetic lines of flux. The holding power of the cylinder is limited by the thickness of the film and not by the magnetic properties of the roll. In the past, such thin metals have not been held securely at the ends of the plate and tend to lift off the cylinder as the cylinder is rotated. Deformation of the plate ends also causes improper seating of the ends of the plate. By the addition of the holddown arrangement specified herein, the holding power of the cylinder at the ends of the plate is independent of the plate thickness but depends only on the holddown bar and cylinder which can be carefully controlled.

The invention is explained in conjunction with the accompanying drawings, in which:

FIG. 1 is an elevational view, partially in section, of a plate cylinder equipped with a printing plate according to the teachings of this invention;

FIG. 2 is an enlarged fragmentary sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 2 but showing the printing plate in an intermediate stage of installation; and

FIG. 4 is an enlarged fragmentary sectional view of an auxiliary cylinder employed in the practice of the invention.

The plate cylinder seen in FIG. 1 is generally designated by the numeral 10 and is intended for rotatable mounting in a printing press (not shown). For this purpose, the cylinder 10 is equipped with journals as at 11. The cylinder 10 includes an elongated shaft portion 12 integral with the journals 11 and mounted on the shaft 12 are a plurality of magnetic discs 13. Each magnetic disc 13 is separated from an adjoining disc by means of a non-magnetic separator as at 14. In the particular installation illustrated, the polar arrangement of the magnetic discs 13 is such as to have alternating poles adjacent each other in adjacent discs. The magnetic discs 13 and the magnet separators 14 are all maintained in the position seen in FIG. 1 by virtue of lock nuts 1a mounted on the ends of the shaft 12.

Referring now to FIG. 2, a segment of a magnetic disc 13 is seen to be equipped with a longitudinally or axially extending groove generally designated 14. The groove receives the ends 15a and 15b of printing plate 15 (the printing plate being designated in FIG. 1). Clamping the ends of the printing plate within the recess 14 is a retainer bar generally designated 16.

It will be noted that the retainer bar 16 is equipped with a radially inwardly extending tongue portion 17 (radially relative to the disc 13). The tongue portion 17 is seen to be received in a mating or conforming portion 18 provided as part of the groove 14. Outwardly, i.e., laterally of the conforming groove portion 18, the groove 14 is equipped with sloping surfaces as at 19 which are angled outwardly at an angle in the illustration given 75° relative to a radial line from the axis of the cylinder 13 to the center of the bar 16. We find that angles of the order of about 75° to about 80° are especially suited for this purpose.

The bar 16 is equipped with winged portions as at 20 which extend laterally from the groove portion 17 and which contact with the surfaces 19 in clamping the ends 15a and 15b in an immobile fashion. The undersides (as pictured) of the wings 20 as at 20a in FIG. 2, are sloped similar to the surfaces 19.

In the illustration given, the width of the tongue portion is about 0.125" and the depth of the conforming groove portion 18 (relative to the cylindrical surface of the cylinder 13) is about 0.065". The overall width of the groove 14 is 0.313" and the bar 16 has a width of 0.250" to provide wings 20 having widths of the order of 0.065".

In the practice of the invention, we first install the plate 15 on an auxiliary cylinder 21 as seen in FIG. 4. The auxiliary cylinder 21 is of the same diameter as the plate cylinder 13 but differs therefrom in having a slot or groove 22 which is approximately 6/32 less in width than the master cylinder 13. The plate 15 before installation on the auxiliary cylinder 21 is advantageously passed through a roll former (a steel and rubber roll combination) to provide an initial curvature to the steel-backed plate 15. With this initial curvature, the plate 15 is installed on the auxiliary cylinder 21 and the leading and trailing edges of the plate 15 are deformed as at 23. This is advantageously achieved through the operation of a resilient material-faced bar 24. For example, the bar or press may include a steel element 25 which is equipped with a surface confronting the groove 22 constructed of rubber, solid urethane (70 to 90 durometer A scale) or the like as at 26.

The groove 22 in the auxiliary cylinder 21 is somewhat less than the corresponding groove 14 in the master cylinder 13 to insure that the crease lines on the steel-backed plate will project beyond the edge of the slot or groove 14 when the plate 15 is installed on the master cylinder 13. The auxiliary cylinder 21 is not as elaborate as the master cylinder 13, lacking the journals, etc., present in an operational cylinder.

In the further practice of the invention, we then install a guide member as at 27 in FIG. 3. The guide member 27 has a tongue portion 28 contoured to fit within the recessed portion 18 and above the tongue portion, the guide member 27 has a block portion as at 29. In the illustration given, the block portion has a width of 1/32" and this provides side surfaces as at 30 which are used to establish a straight edge transversely across the cylinder. The plate 15 to be mounted is butted against this guide, and as the roll is rotated, the plate will be drawn against the cylinder. When the plate is mounted, the guide member 27 is removed. This then establishes the printing plate 15 in a predetermined position on the cylinder 13. Thereafter, the retainer bar 16 is mounted as seen in FIG. 2 and this achieves the advantageous clamping action.

While in the foregoing specification a detailed description of an embodiment of the invention has been set down in considerable detail for the purpose of explaining the same, many variations of the details hereinafter given may be made by those skilled in the art without departing from the spirit and scope of the invention.
We claim:

1. In combination, a printing press equipped with a rotatably mounted plate cylinder having a plurality of axially-spaced magnetic discs for attaching a metal-backed printing plate in conforming relation to the cylinder surface, an axially-extending groove in said cylinder surface, a plate wrapped on said cylinder with straight side edge portions disposed in spaced apart relation in said groove, and an elongated paramagnetic metal bar removably mounted in said groove between said edge portions and adjacent to said discs and equipped with laterally-extending integral wings overlying said edge portions whereby the edge portions are held immobile in said groove by the magnetic force applied to said bar.

2. The structure of claim 1 in which said bar is equipped with an axially-extending tongue portion having a generally rectangular cross-section, said groove in the innermost portion thereof having a depression constructed and arranged to receive said tongue portion, said tongue portion being received within said depression with said wings being received within said groove outwardly and laterally of said depression.

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