

ROTARY DRUM FOR A PAPER TRANSFERRING MECHANISM
OF AN OFFSET PRINTING MACHINE

The invention relates to a paper transferring mechanism of an offset printing machine, and more particularly to a paper transferring mechanism with an improved rotary drum.

Referring to Figure 1, a conventional offset printing machining is shown to comprise: a machine frame (1), a first plate cylinder (2), a first blanket cylinder (3), an impression cylinder (4), a second plate cylinder (2a), a second blanket cylinder (3a), a paper transferring mechanism (5), a chain assembly (6), and a receiving bin (7).

An automatic paper feeder (not shown) feeds a sheet of paper (8) to the impression cylinder (4). The image to be printed is formed on the first and second plate cylinders, (2) and (2a), and is transferred to the first and second blanket cylinders, (3) and (3a). The impression cylinder (4) presses the paper (8) against the blanket cylinders, (3) and (3a), to print the image on the paper (8). The paper transferring mechanism (5) supports the printed paper (8) and transfers the same to claws (6a) on the chain assembly (6). The printed paper (8) is then collected in the receiving bin (7).

Referring to Figure 2, a rotary drum of the conventional paper transferring mechanism (5) is shown to comprise three C-shaped support plates (5b) and

three mounting seats (5a) which mount the support plates (5b) onto a rotary shaft (9). The periphery of the plates (5b) should support the paper (8) only at the blank portions of the latter. This is necessary so as to prevent the plates (5b) from scraping against the printed surface of the paper (8). Thus, the positions of the plates (5b) on the axle (9) should be adjusted to correspond with the blank portions of a new image to be printed so that the plates (5b) can properly support the paper (8) while avoiding damage to the printings thereon.

The drawbacks of using the above disclosed conventional paper transferring mechanism (5) are as follows:

1. Actual experience shows that at least one hour is required to properly adjust the positions of the plates (5b) on the axle (9). Furthermore, several trial prints should be done before one can accurately determine whether or not the plates (5b) are already in their proper positions. This decreases the efficiency of material use of the conventional offset printing machine.

2. The conventional paper transferring mechanism (5) cannot be used if the image to be printed has little or no blank portions (such as in borderless images).

3. There is, available, a paper transferring mechanism which uses air spray to support and transfer

paper. Aside from the high equipment and maintenance costs thereof, frequent cleaning must be conducted so as to prevent blockage of the outlet ports of its air tube and eventual damage to its motor.

5 Therefore, the objective of the present invention is to provide a rotary drum for a paper transferring mechanism which can overcome the above mentioned drawbacks of the prior art.

10 More specifically, the main objective of the present invention is to provide a paper transferring mechanism with a rotary drum which does not need to be adjusted whenever the printing of a new image is to be initiated.

15 Another objective of the present invention is to provide a paper transferring mechanism with a rotary drum that can be used even when the image to be printed has little or no blank portions.

20 Yet another objective of the present invention is to provide a paper transferring mechanism with a rotary drum that is simple and relatively inexpensive.

25 Accordingly, the preferred embodiment of a rotary drum operates cooperatively with an impression cylinder of an offset printing machine to transfer a sheet of printed paper from the impression cylinder and comprises: a rotary shaft; at least two end plates each being provided with a sectoral cut-out, a central opening to receive the rotary shaft, and an arc-shaped

periphery; means for spacedly securing the end plates onto the rotary shaft; a shell plate curved around the rotary shaft and having an inner surface contacting and secured to the arc-shaped periphery of the end plates, 5 the shell plate having a discontinuation aligned with the cut-out, the shell plate further having two circumferential margins and two axially extending margins disposed adjacent to the discontinuation; and a screen-like woven fabric sheet covering an outer 10 surface of the shell plate, the fabric sheet having elongated pleats which extend in the axial direction of the shell plate and four edges being bonded to the axially extending margins and to the circumferential margins of the shell plate, the fabric sheet being 15 stretched tensely in an axial direction of the shell plate and being elastic in directions parallel to the circumferential margins, the fabric sheet being movable relative to the outer surface of the shell plate and contacting a printed surface of the printed paper when 20 the printed paper is moved between the impression cylinder and the rotary drum.

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with 25 reference to the accompanying drawings, of which:

Figure 1 is a schematic diagram of a conventional offset printing machine;

Figure 2 is a perspective view of a rotary drum of a conventional paper transferring mechanism of the offset printing machine shown in Figure 1;

Figure 3 is a perspective view of the preferred embodiment of a rotary drum for a paper transferring mechanism according to the present invention; and

Figure 4 is a side view of the rotary drum shown in Figure 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 3 and 4, the preferred embodiment of a rotary drum for a paper transferring mechanism of an offset printing machine is shown to comprise: a pair of spaced mounting seats (10); a pair of metal end plates (20); a rotary shaft (30); a shell plate (40); a bonding means (50); and a screen-like woven fabric sheet (60).

The mounting seats (10) are similar in construction to the mounting seats (5a) shown in Figure 2. Each of the mounting seats (10) includes upper and lower arched halves, (11) and (15). An upright ear (12) is formed on each end of the upper arched half (11). Each ear (12) has an axial through hole (13). The upper arched half (11) is further provided with a radial inward projection (14). The lower arched half (15) is provided with a pair of ears (151) which are aligned with the ears (12) of the upper arched half (11). Each ear (151) has an axial threaded opening (16). Bolts (17) are

provided to fasten the upper and lower arched halves, (11) and (15), at the ears, (12) and (151). The upper and lower arched halves, (11) and (15), cooperatively form an annular seat which defines a central opening to receive the rotary shaft (30). The rotary shaft (30) has an axially extending groove (see Figure 2) to receive the inward projection (14) and prevent rotation of the mounting seats (10) relative to the same. The mounting seats (10) are spaced along the length of the rotary shaft (30). The periphery of the lower arched half (15) is further provided with three screw socket projections (19).

Each of the end plates (20) has an arc-shaped periphery and is provided with a sectoral cut-out (21) and a central opening to receive the rotary shaft 30. Each of the end plates (20) are further provided with three through holes (not shown) disposed adjacent to the periphery surrounding the central opening thereof. Screws (25) extend through the through holes of the end plates (20) and engage the screw socket projections (19) to fasten the end plates (20) to the mounting seats (10).

The characterizing features of the present invention are as follows: The inner surface (41) of the shell plate (40) is secured to the arc-shaped periphery of the end plates (20). The shell plate (40) further has a discontinuation aligned with the sectoral cut-outs

(21). The shell plate (40) may be made of any rigid or semi-rigid material, such as rust-proofed metal, iron, wood, rubber, etc.

5 The fabric sheet (60) covers the outer surface of the shell plate (40). The bonding means (50) is provided on two axially extending margins and on two circumferential margins of the inner surface (41) of the shell plate (40) so as to secure the fabric sheet (60) onto the shell plate (40). The bonding means (50) may be glue, double-sided adhesive, or VELCRO^(RTM) hook and loop fasteners. In the preferred embodiment, VELCRO^(RTM) hook and loop fasteners (50) are provided on the inner surface (41) of the shell plate (40) and on the four edges of the inner surface of the fabric sheet (60).

15 The fabric sheet (60) is provided with elongated pleats which extend in the axial direction of the shell plate (40). Thus, the fabric sheet (60) is stretched tensely in the axial direction of the shell plate (40), but is elastic in directions parallel to the circumferential margins of the shell plate (40).

25 The printed surface of a sheet of printed paper from the impression cylinder contacts the fabric sheet (60) when the preferred embodiment is in use (Refer to Figure 1). No relative movement exists between the printed paper and the fabric sheet (60) in order to eliminate smearing of the printed paper. However, limited movement of the fabric sheet (60) relative to

the shell plate (40) is possible since the fabric sheet (60) is elastic in directions parallel to the circumferential margins of the shell plate (40). The fabric sheet (60) thus serves as a buffer which permits the movement of the printed paper relative to the shell plate (40) without producing a rubbing action that will cause the printed surface of the paper to smear. The shell plate (40) rotates with the rotary shaft (30) so as to transfer the paper to the next operation. The elongated pleats of the fabric sheet (60) prevent the stretching of the fabric sheet (60) in the axial direction of the shell plate (40) in order to stabilize the movement of the printed paper relative to the shell plate (40).

To assemble the preferred embodiment, the shell plate (40) is first secured to the arc-shaped periphery of the end plates (20). The lower arched halves (15) are then mounted on the end plates (20). The end plates (20) are then fitted onto the rotary shaft (30), and the upper arched halves (11) are attached to the lower arched halves (15). The bonding means (50) is provided on the inner surface (41) of the shell plate (40). Finally, the fabric sheet (60) is attached to the shell plate (40) to cover the outer surface of the shell plate (40).

The advantages of using the paper transferring mechanism of the present invention are as follows:

1. The preferred embodiment does not require an adjustment procedure each time a new image is to be printed.

2. The preferred embodiment can be used even when
5 the image to be printed has little or no blank portions.

3. The preferred embodiment is simple in construction and is thus, relatively inexpensive.

CLAIMS:

1. A rotary drum operating cooperatively with an impression cylinder of an offset printing machine to transfer a sheet of printed paper from the impression cylinder, comprising:
- 5 a rotary shaft;
- at least two end plates each being provided with a sectoral cut-out, a central opening to receive said rotary shaft, and an arc-shaped periphery;
- 10 means for spacedly securing said end plates onto said rotary shaft;
- a shell plate curved around said rotary shaft and having an inner surface contacting and secured to said arc-shaped periphery of said end plates, said shell plate having a discontinuation aligned with said cut-
- 15 out, said shell plate further having two circumferential margins and two axially extending margins disposed adjacent to said discontinuation; and
- a screen-like woven fabric sheet covering an outer
- 20 surface of said shell plate, said fabric sheet having four edges being bonded to said axially extending margins and said circumferential margins of said shell plate, said fabric sheet being stretched tensely in an axial direction of said shell plate and being elastic
- 25 in directions parallel to said circumferential margins, said fabric sheet being movable relative to the outer surface of said shell plate and contacting a printed

surface of said printed paper when said printed paper is moved between said impression cylinder and said rotary drum.

5 2. The rotary drum as claimed in claim 1, wherein said fabric sheet is formed with elongated pleats which extend in the axial direction of said shell plate.

3. The rotary drum as substantially described hereinbefore with reference to Figures 3 and 4.
