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(71) Applicant: **TETRA PAK INTERNATIONAL AKTIEBOLAG**
Rabyholms Alle
Lund(SE)

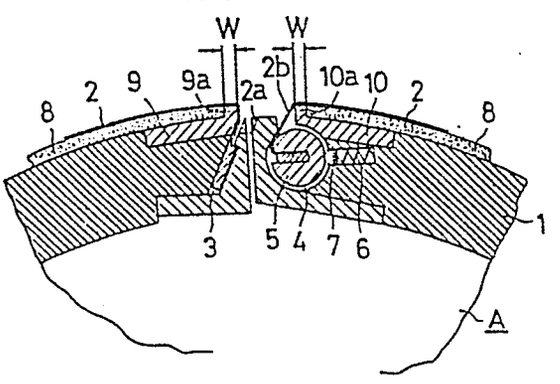
(72) Inventor: **Katsumata, Ryuzo**
355-2, Hitosugi
Gotenba-City, Shizuoka(JP)

(74) Representative: **Glawe, Delfs, Moll & Partner**
Patentanwälte
Postfach 26 01 62 Liebherrstrasse 20
D-8000 München 26(DE)

(54) Plate cylinder for printer.

(57) A plate cylinder (A) for a printer has a printing plate (2) made of a resin, and a cushioning medium (8) interposed between the printing plate (2) and the cylinder (A). In the vicinity of a slot (4) where the ends (2a,2b) of the resin printing plate (2) are inserted and fixed the end portions of said printing plate (2) may be additionally supported by backing plates (9, 10) in order to prevent these portions of the printing plate to sink into the cushioning medium (8).

FIG. 2



EP 0 136 707 A2

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PLATE CYLINDER FOR PRINTER

In a flexographic printer, as shown in Fig. 3, printing ink is applied by an inking roller B to a rubber printing plate mounted over the outer peripheral surface of a rotating plate cylinder A and, for example, a sheet of cardboard D used for packaging is passed between the plate cylinder A and an impression cylinder C to effect the desired printing on the surface of the cardboard D.

The rubber printing plate used in such a printer, although very capable of absorbing the vibrations generated during the operation of the printer, soon becomes worn and can not last for long. It also presents problems concerning pressure resistance and manufacturing cost.

It has been suggested that resin instead of rubber could be used for this printing plate. A resin printing plate would have cost and pressure resistance advantages, but on the other hand, because of the innate hardness of resins, such a resin printing plate would be very hard so that uneven printing could result from its use. Such a plate would also be unable to sufficiently absorb the vibrations generated during the printers operation, so that it could even be impossible

in some cases to perform the printing operation. If specific type of resin which is photosensitive is used, it would be possible to produce identical plates in bulk by a baking technique, and also the plate producing process would be greatly simplified.

The present device relates to an improvement in a plate cylinder for a printer, and the object of the device is to remove the defects involved when using resin for the printing plate, while maintaining the advantages of such a resin plate, and for this purpose, the device features the incorporation of a cushioning medium between the outer peripheral surface of the plate cylinder and the resin printing plate mounted thereon.

An embodiment of the device will be described below with reference to the accompanying drawings.

The accompanying drawings illustrate an embodiment of the plate cylinder for a printer according to the present invention, wherein:

Fig. 1 is an enlarged longitudinal section of the part of a plate cylinder where a resin printing plate is attached to the cylinder.

Fig. 2 is a similar enlarged longitudinal section of a modification thereof.

Fig. 3 is a diagrammatic drawing of the basic principle of the flexographic printer.

An aluminum plate 1 is attached over the outermost layer of a roll-shaped plate cylinder A, and part of the aluminum plate 1 is provided with means for securing a resin printing plate 2 over the entire width of the plate cylinder A. The securing means, in the embodiment shown in Figs. 1 and 2, comprises two slots or recesses 3 and 4, one of them (3) extending linearly inward, and the other (4) having an internal portion formed as a chamber which is circular in section.

The two slots 3 and 4 are adjacent to each other along the widthwise direction of the plate cylinder A. One edge 2a of the resin printing plate 2 would around the outer periphery of the cylinder A is inserted into the slot 3, and the other edge 2b of the printing plate is inserted into a notch in a holder 5 placed in the chamber within the slot 4 to secure the printing plate in position. When the holder 5 within the chamber in the slot 4 is turned counterclockwise in Figs. 1 and 2, the resin printing plate 2 is tightened over the outer peripheral surface of the cylinder A, and a rounded projection 7 is pushed into the holder-housing chamber by the force of a spring 6, and is pressed against and engages with a flat part on the outer peripheral surface of the holder 5 to lock the holder 5 in the chamber, so that the printing plate 2 is secured tightly over the outer peripheral surface of the plate cylinder A.

In this way, the resin printing plate 2 is secured in position over the outer peripheral surface of the plate cylinder A. In the present device, a cushioning medium 8 is interposed between the resin printing plate 2 and the outer peripheral surface of the plate cylinder A.

The cushioning medium 8 used in the present device could be a sponge material, and it could be secured to the outer peripheral surface of the plate cylinder A by, for example, doulbe-sided adhesive tape.

The use of this cushioning medium between the outer peripheral surface of the plate cylinder A and the resin printing plate 2 has the effect of counteracting the hardness of the resin plate 2 to maintain the moderate resiliency necessary for printing, thereby eliminating the danger of uneven printing, and enabling a good finish.

In a preferred embodiment shown in Fig. 2, backing plates 9 and 10 are provided at the inlets of the slots 3 and 4, respectively, the backing plates 9 and 10 being provided with raised portions or protuberances 9a and 10a, respectively, along the adjacent edges thereof, the protuberances 9a and 10a being designed to support the printing plate 2 by slightly raising it. The backing plates have the following effect.

In the plate cylinder of Fig. 1, the parts of the resin printing plate 2 near the places where the edges turn down (that is, the parts corresponding to the portions of width W in Fig. 2) tend to sink slightly, which could blur the print on the corresponding part of the cardboard surface, but when the backing plates 9 and 10 are provided in these areas so as to support the printing plate 2 in a slightly raised manner by the protuberances 9a and 10a, as shown in Fig. 2, this problem can be solved and a clear print obtained. In this case, it is recommended to make an arrangement whereby the protuberances 9a and 10a are positioned slightly below the surface of the cushioning medium 8.

The present device, because of the use of a resin printing plate instead of rubber one, provides cost and pressure resistance advantages, and also, since the hardness inherent to the resin material is counteracted by the cushioning medium 8 between the outer peripheral surface of the plate cylinder A and the printing plate 2, the possibility of uneven printing or the generation of vibrations in the plate cylinder during operation is eliminated or minimized.

Moreover, because of the provision of the cushioning medium 8 between the outer peripheral surface of the plate cylinder A and the resin printing plate 2, the thickness of the printing plate can be greatly reduced. This thickness could, for instance, be

less than 1.7 mm, and it has been confirmed by laboratory tests that a satisfactory result is obtained by using a printing plate of a thickness less than that required when no cushioning medium is provided.

If a photosensitive resin is used, it is possible to make the plate by utilizing a baking technique, so that the plate manufacturing process is extremely simple, and identical can be produced in bulk.

The present device has been described by way of an embodiment using a printing plate of the type which is secured to the plate cylinder by a securing means as explained above, but it is of course similarly applicable to a sleeve-like plate fitted over the plate cylinder from the side thereof.

List of reference numerals:

2...resin printing plate, 2a, 2b...edges of resin plate, 3, 4...slots, 5...holder, 6...spring, 7...projection, 8... cushioning medium, 9, 10...backing plates, 9a, 10a...protuberances, A...plate cylinder, B...inking roller, C...impression cylinder, D...cardboard.

Claims

(1) A plate cylinder for a printer characterized in that a printing plate mounted onto the outer peripheral surface of said plate cylinder is made of a resin, and a cushioning medium is interposed between the outer peripheral surface of said plate cylinder and said resin printing plate.

(2) A plate cylinder for a printer according to claim 1 in which two slots or recesses are provided in the outer peripheral surface of the plate cylinder and the two end edges of said resin printing plate are inserted into the corresponding slots to attach the printing plate to the outer peripheral surface of the plate cylinder, further characterized in that a backing plate with a raised portion or protuberance is provided at the inlet of each slot at the position where the corresponding portion of the printing plate turn downward, said backing plates being so designed that the turned-down portions of the printing plate are supported by the protuberances of said backing plates.

(3) A plate cylinder according to claim 1 wherein the resin printing plate is photosensitive.

FIG. 3

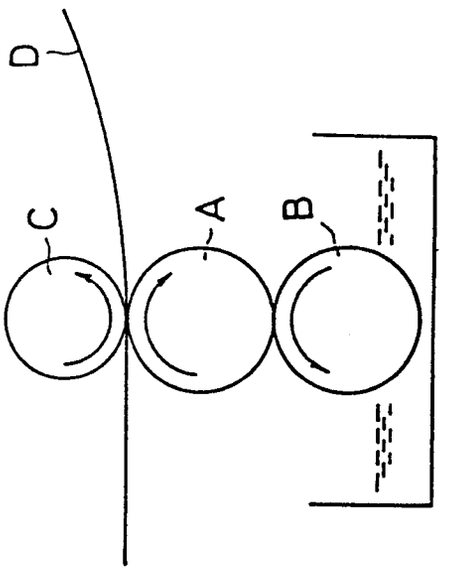

FIG. 1

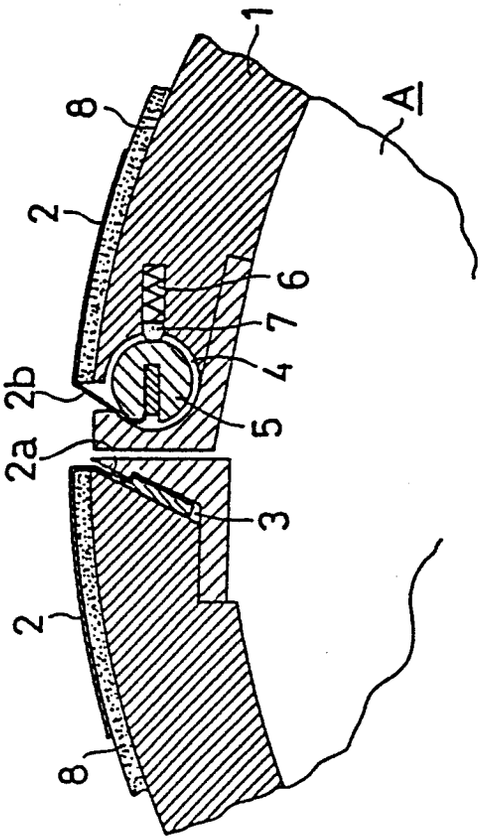

FIG. 2