Printing processes in newspaper production

1995

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Printing Processes In Newspaper Production

Session 7:

Printing processes in newspaper production

Characteristics of the various processes
Inking systems
Damping systems
Plates
Blankets

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PRINTING PROCESSES IN NEWSPAPER PRODUCTION

OFFSET - CONVENTIONAL

FILM INKING

1. UNDERSHOT
2. OVERSHOT
3. PUMP INKING
   (INJECTION INKING)

DUCTOR INKING (Not used in newspaper printing)

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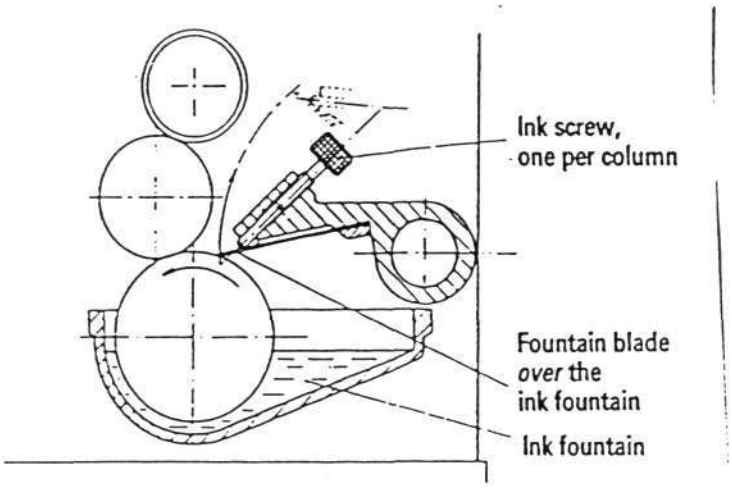

Figure 1. Overshot fountain.

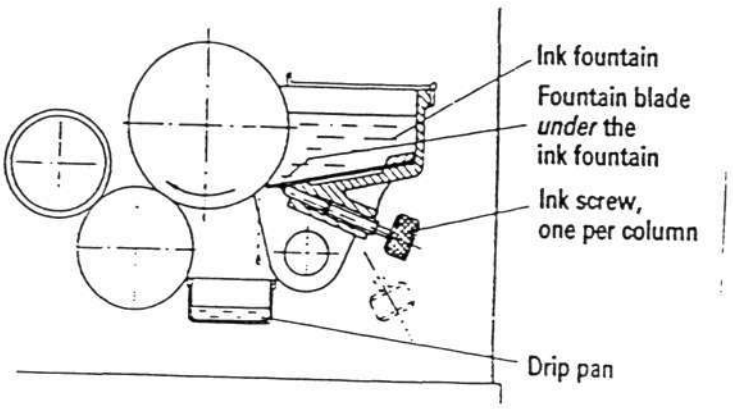

Figure 2. Undershot fountain.

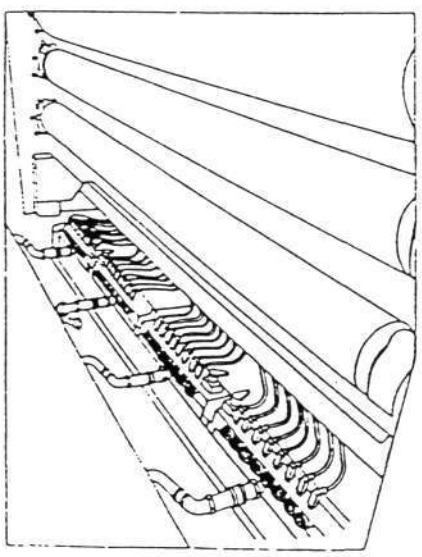

Figure 3. Pump inking system or injector inking.

DEMANDS ON NEWSINK

UNDERSHOT	OVERSHOT	INKPUMPS
Viscous	Less viscous	Even less viscous
Short	Long	Long
High relative polarity for a high water take-up	Low relative polarity for a low water take-up	Even lower relative polarity to avoid excessive water take-up

IN PRACTICE

- Viscous and short inks create greater tendency to linting and rub-off
- if undershot inking is used > use newsprint with low linting and rub-off propensity (rough newsprint)
- Long and low viscous inks have tendency to ink misting and strike-through
- if overshot or pump inking is used, special additives in ink and newsprint with good opacity properties are needed
- High water take-up requires fountain solution with good wetting properties

> Ink, fountain solution, paper, inking unit and blanket properties are inter-related and must be dealt with as an entity

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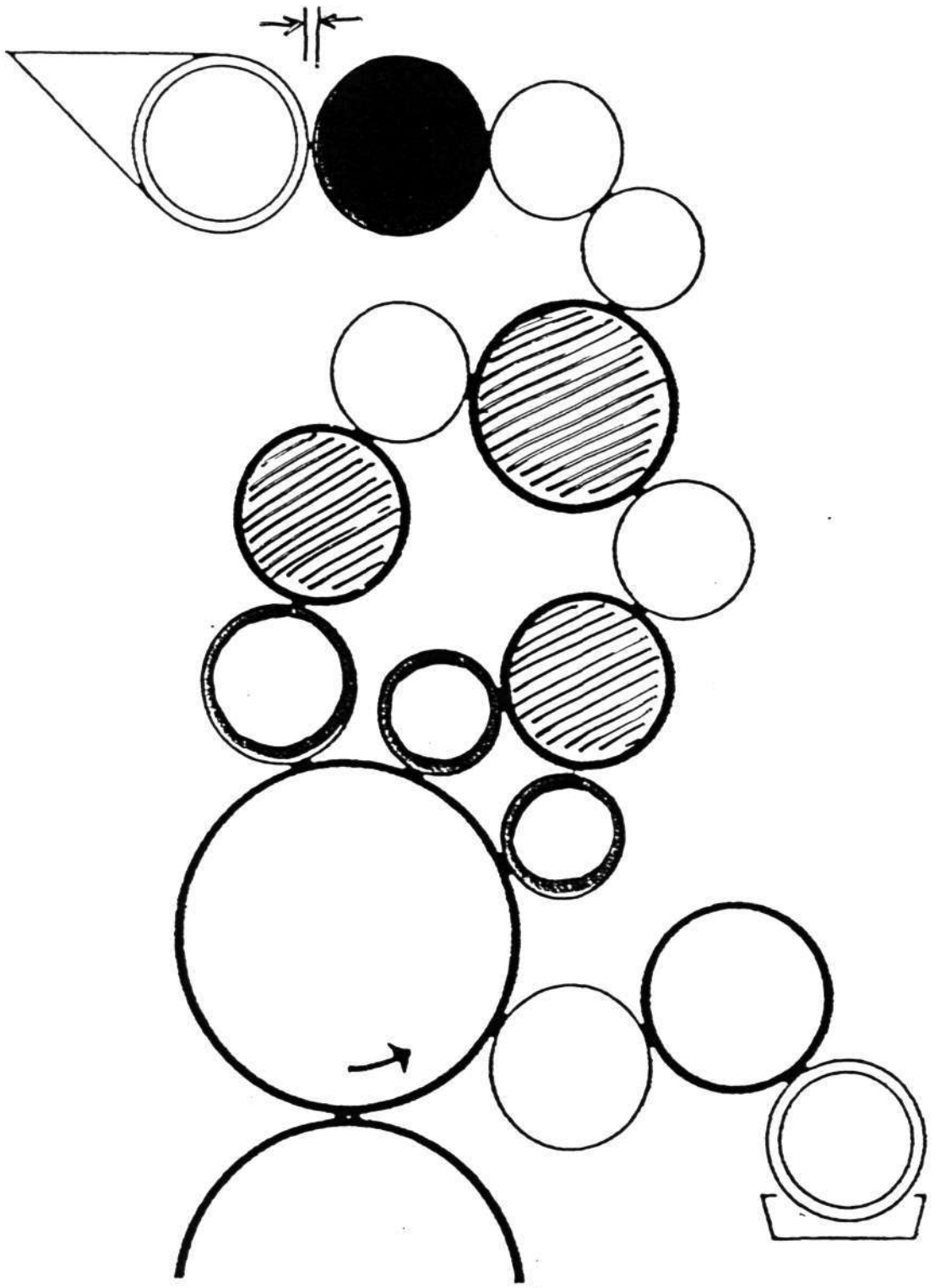

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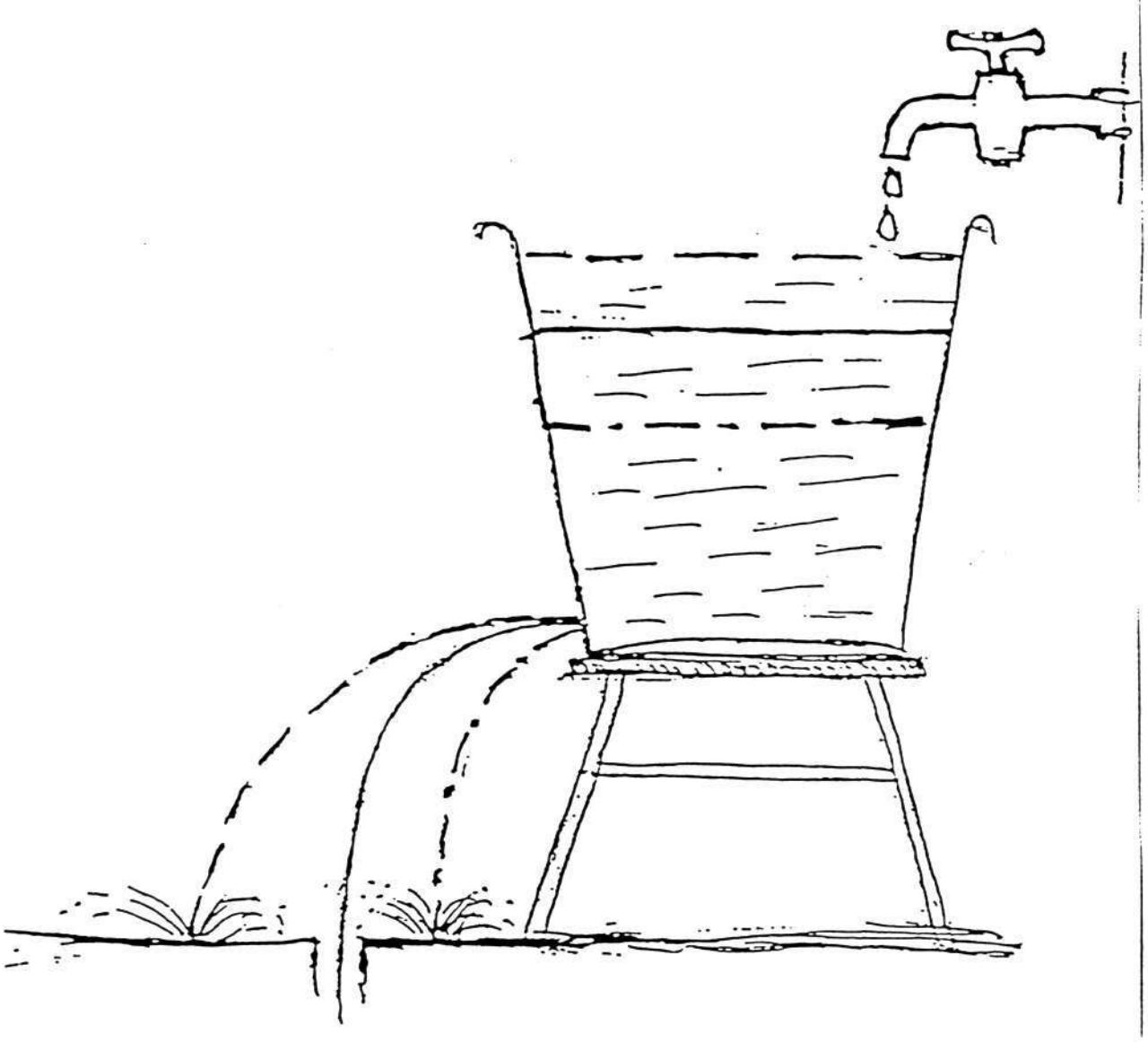

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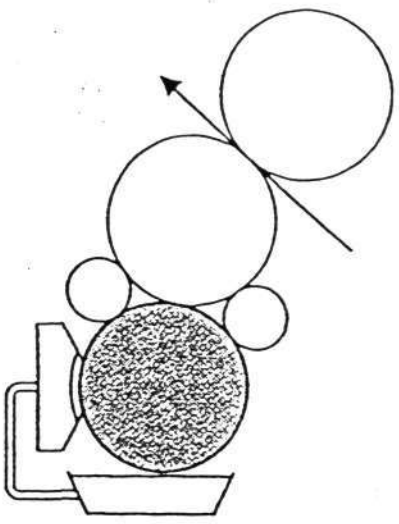
KEYLESS INKING

1. ANILOX LETTERPRESS

The hard letterpress plate has to be protected from the hard anilox-roller by means of soft ink forme rollers.
A short inking unit with no disturbances of emulsification giving a very constant ink feed.
Oil based inks.



Anilox letterpress printing unit

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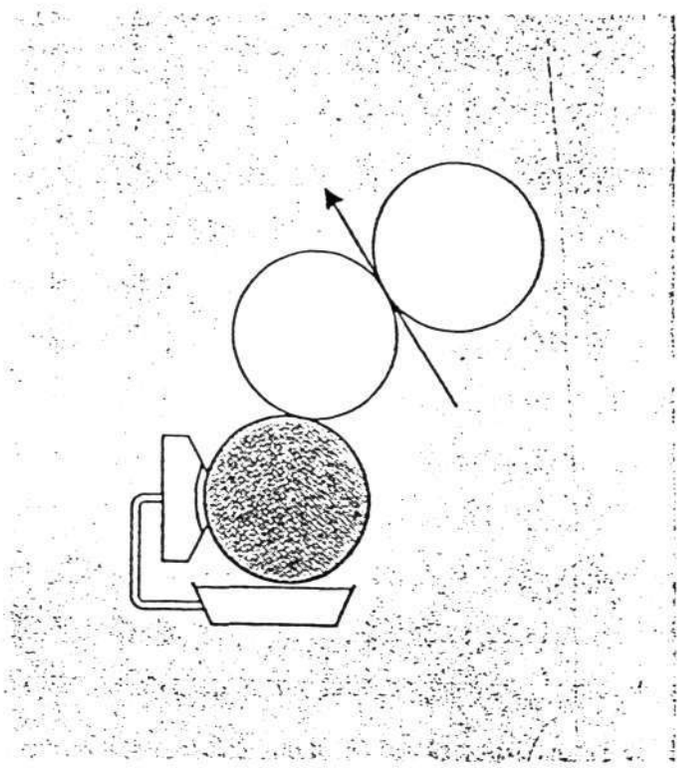
2. ANILOX FLEXO

Because of the soft flexo plate, no ink forme rollers are needed > the shortest possible inking unit.
Water based inks.



Flexo printing unit

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FLEXO AND LETTER-PRESS PRINTING A FEW ASPECTS

The loss of small dots(especially in flexo) deteriorates highlight details significantly.

New screening trends - higher screen rulings and frequency modulated screening - cannot be easily fulfilled in flexo or letterpress.

Whether computer-to-plate will be available for these printing processes is questionable.

However, it must be noted that the best **consistency** in print densities can be achieved with anilox letterpress.

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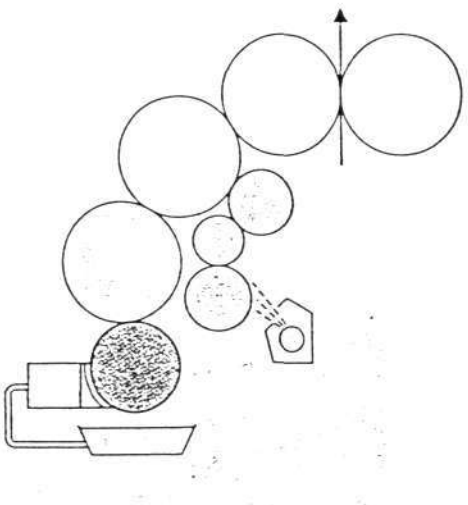
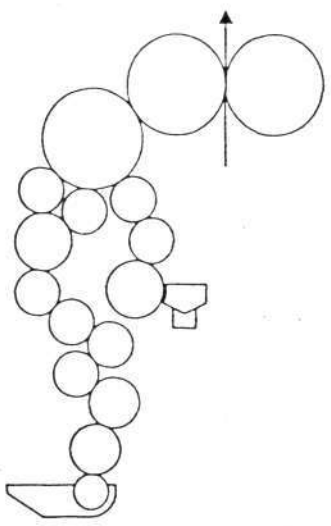
3. ANILOX OFFSET

Issues to consider:
-short inking causes tendency to excessive water in ink
-ink water interactions are very essential
-temerature control to control viscosity
-wearing of anilox rollers
-wearing of ductor blades

To avoid **ghosting**, the forme roller is 1:1 in size to plate cylinder. Oil based



Anilox offset printing unit



Offset printing unit

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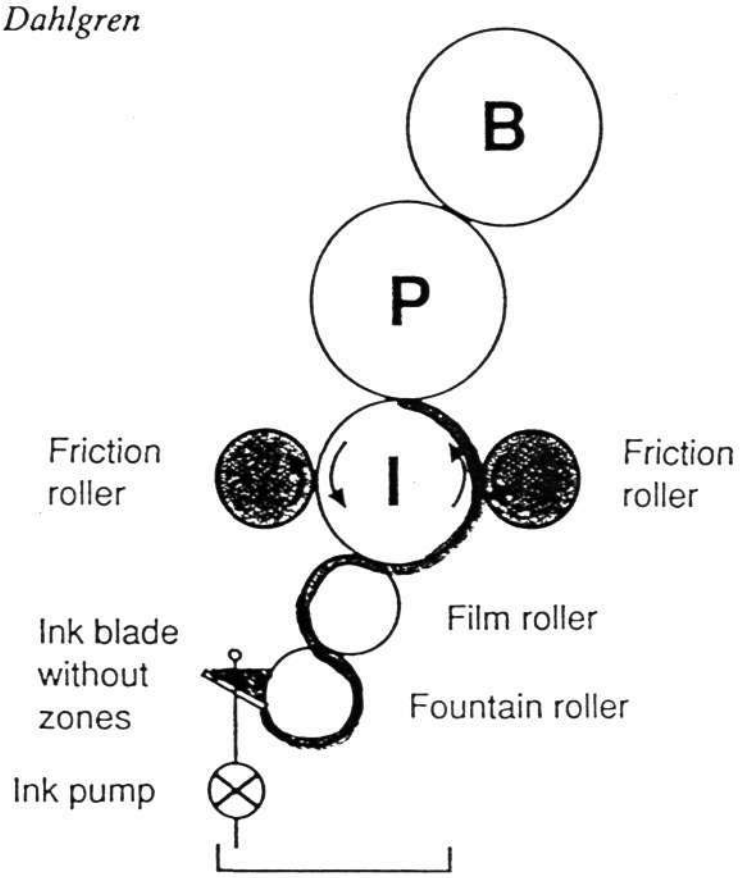
Harold Dahlgren



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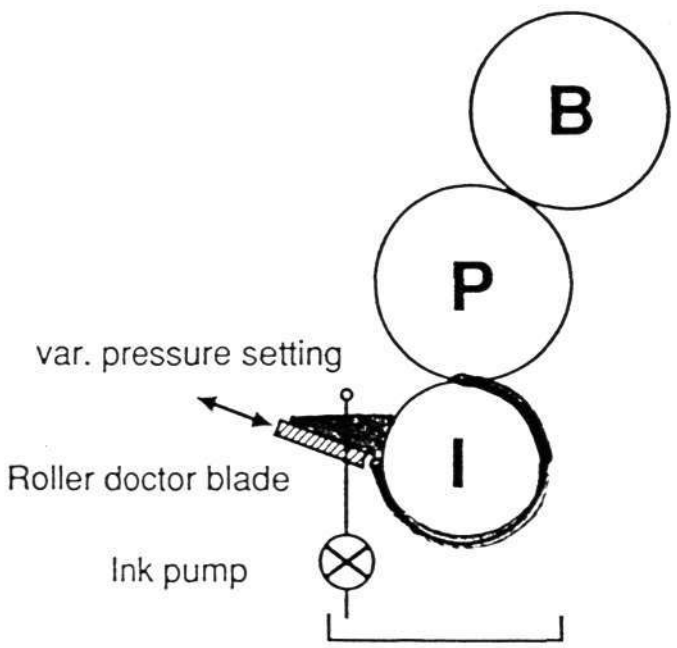
Louis Jean Chambon



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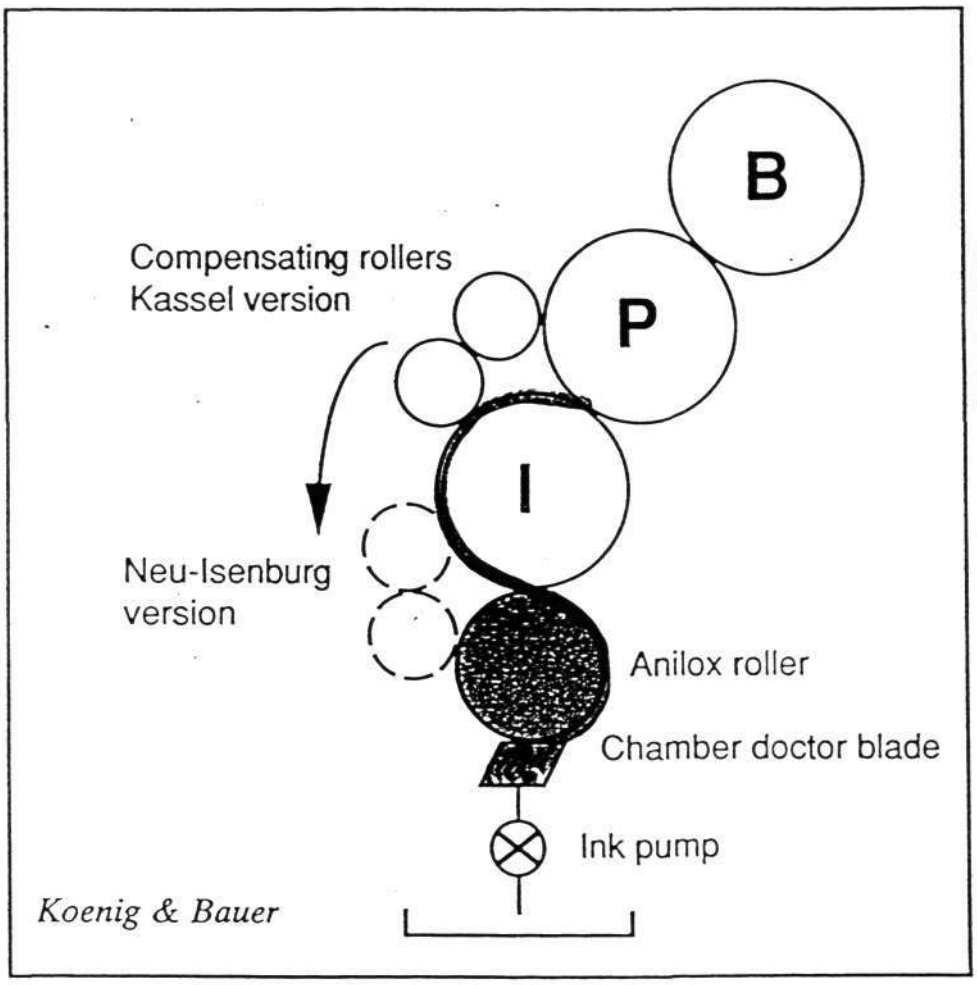

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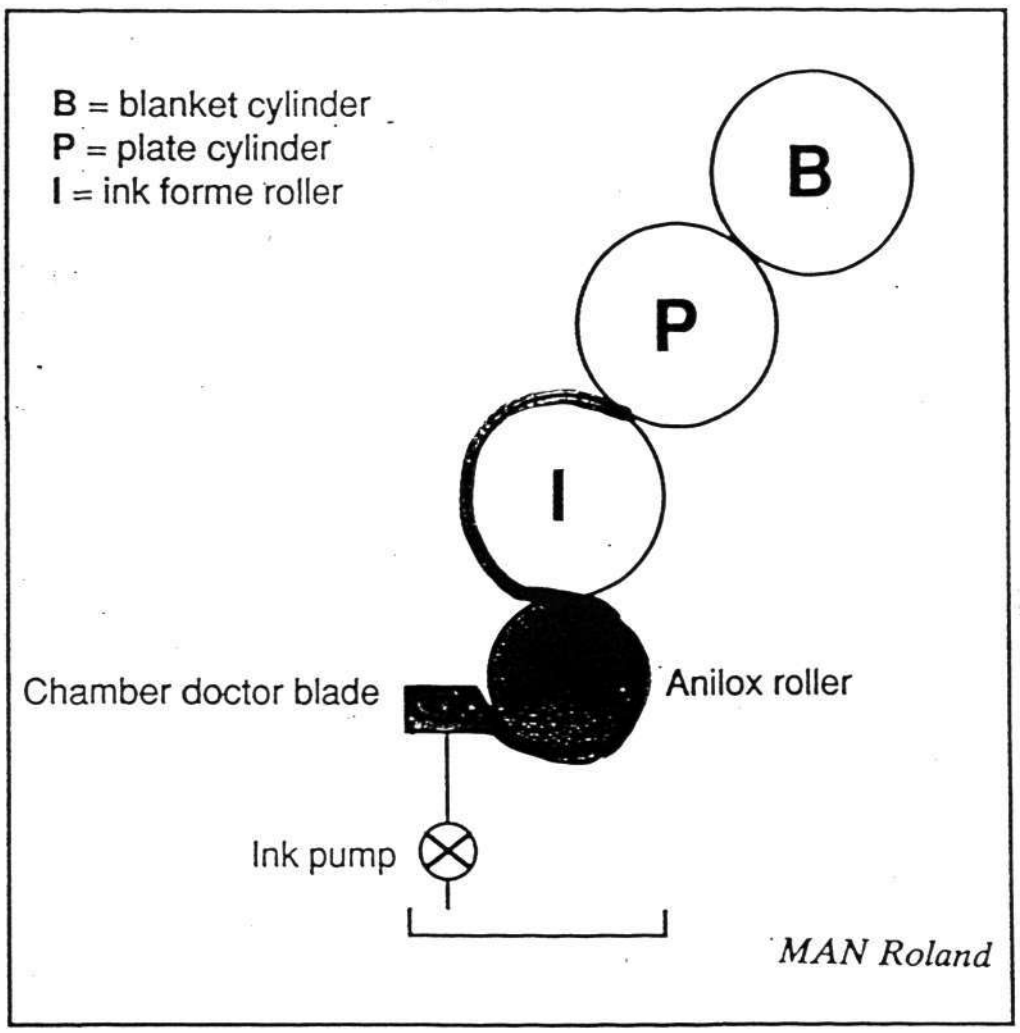

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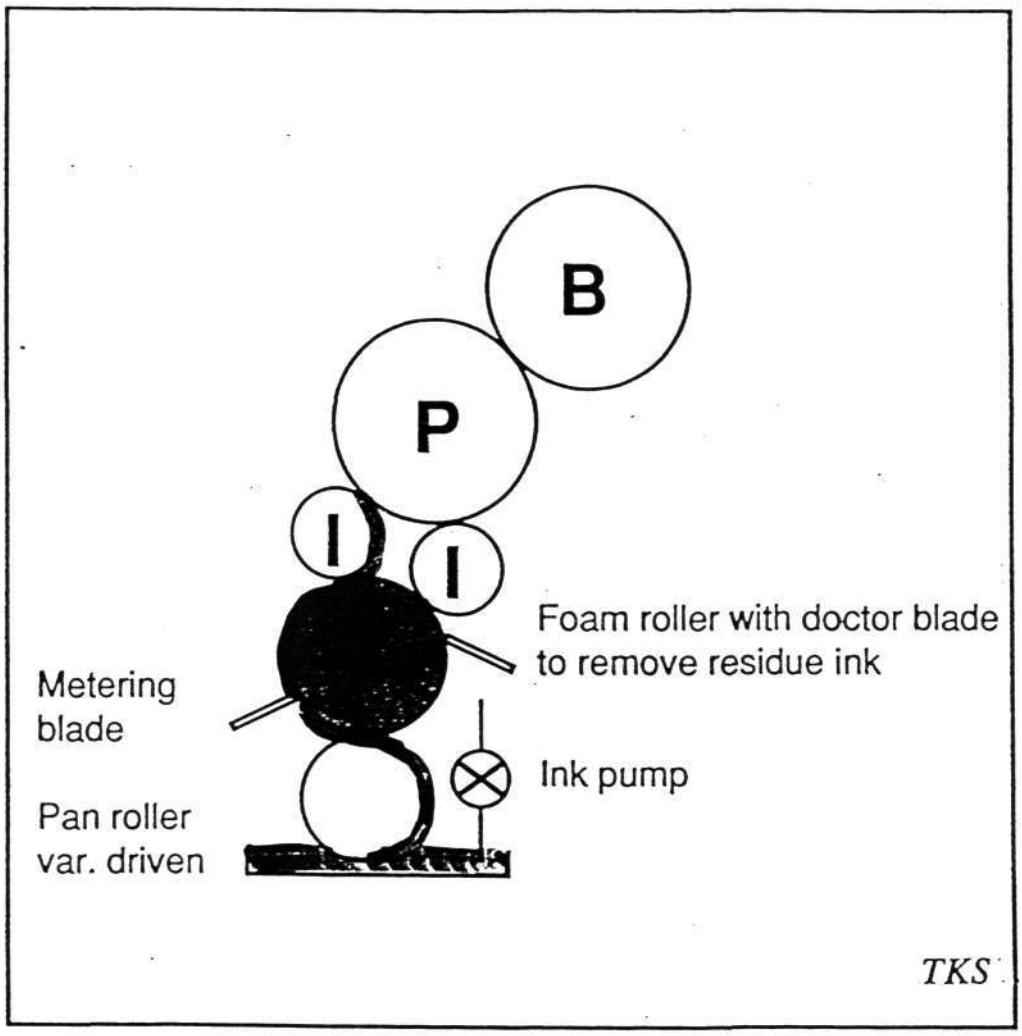

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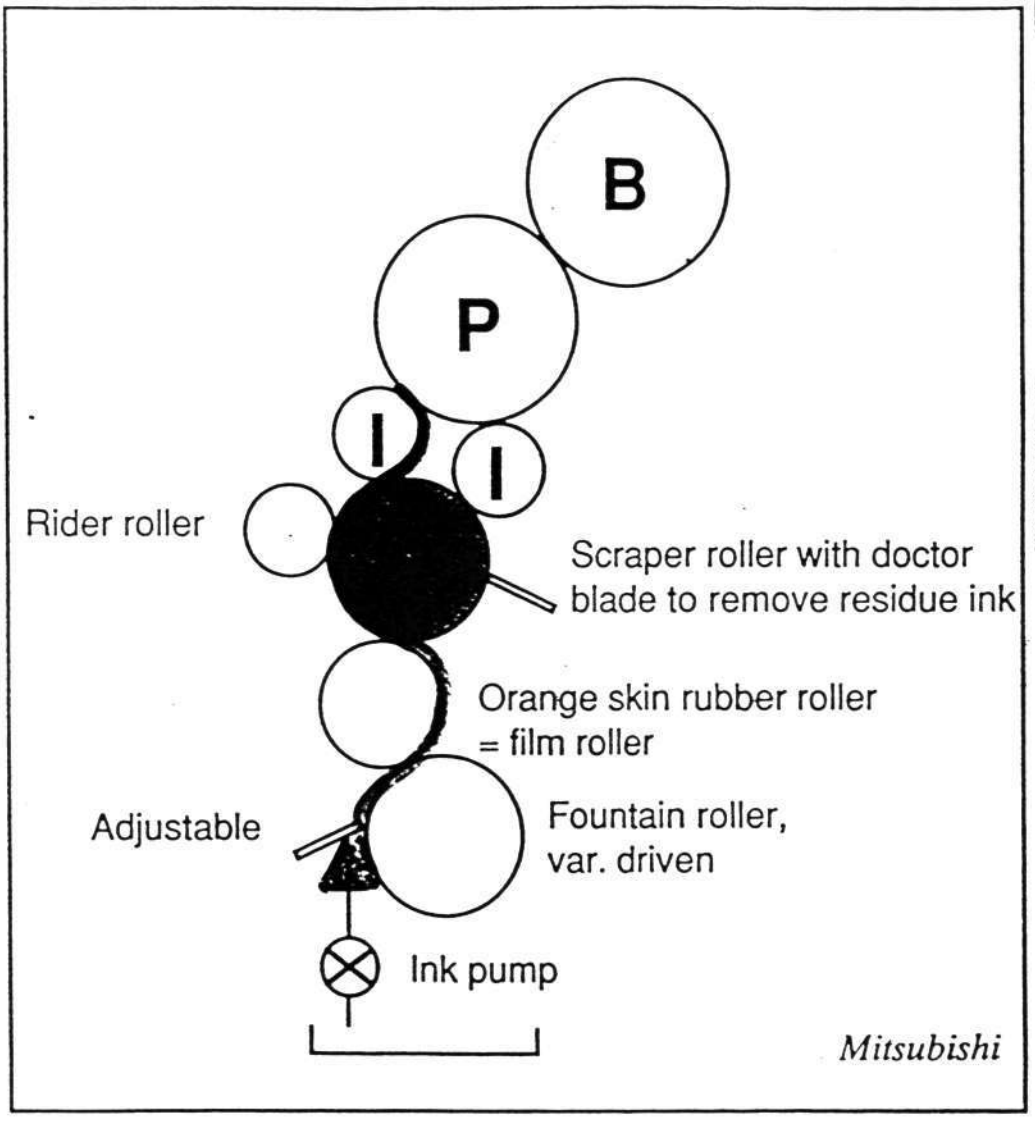

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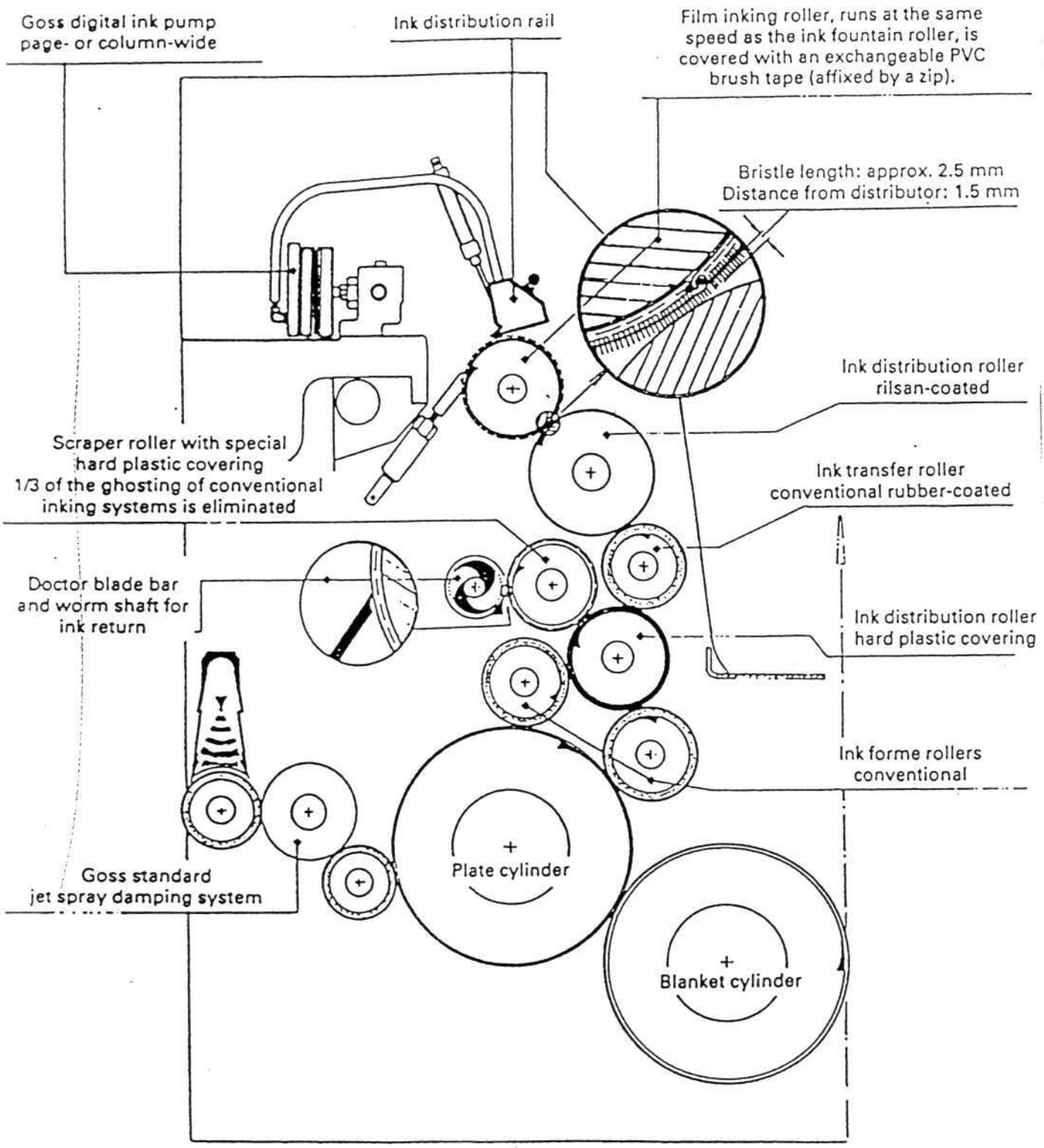

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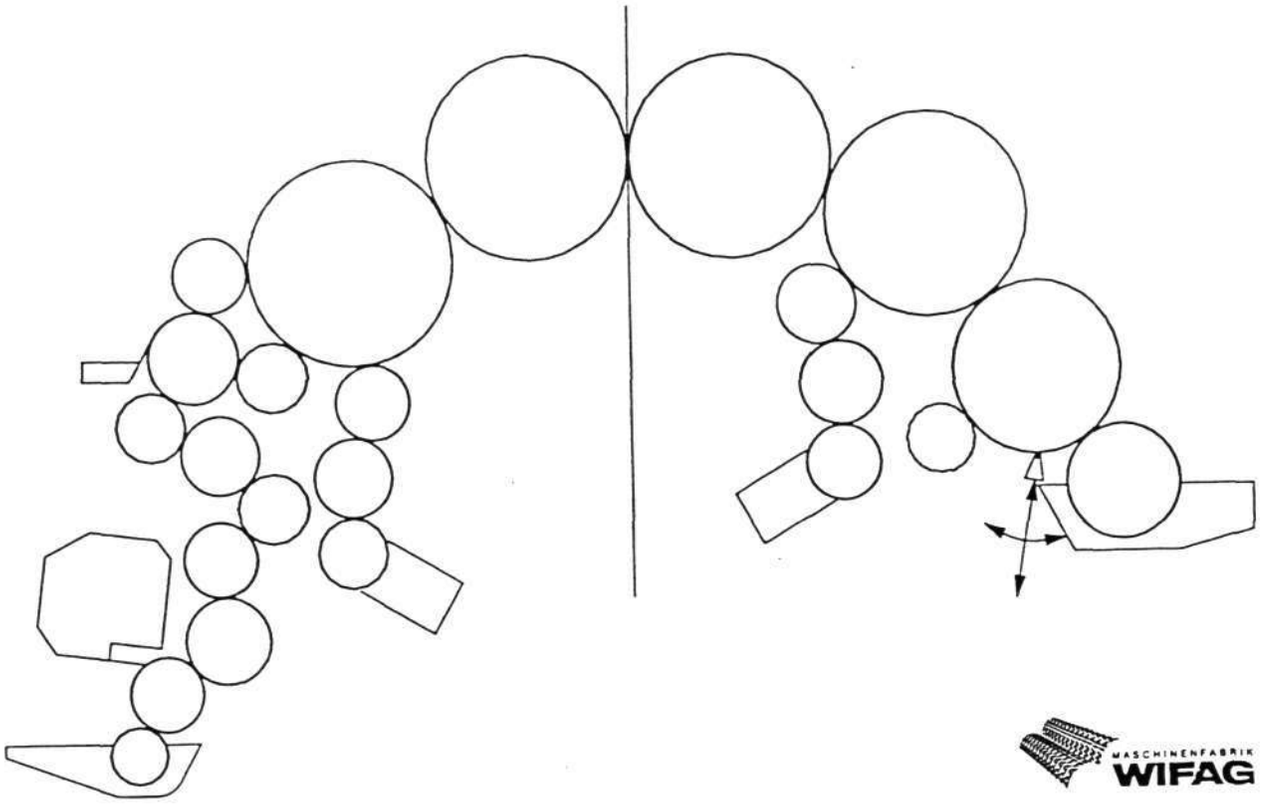
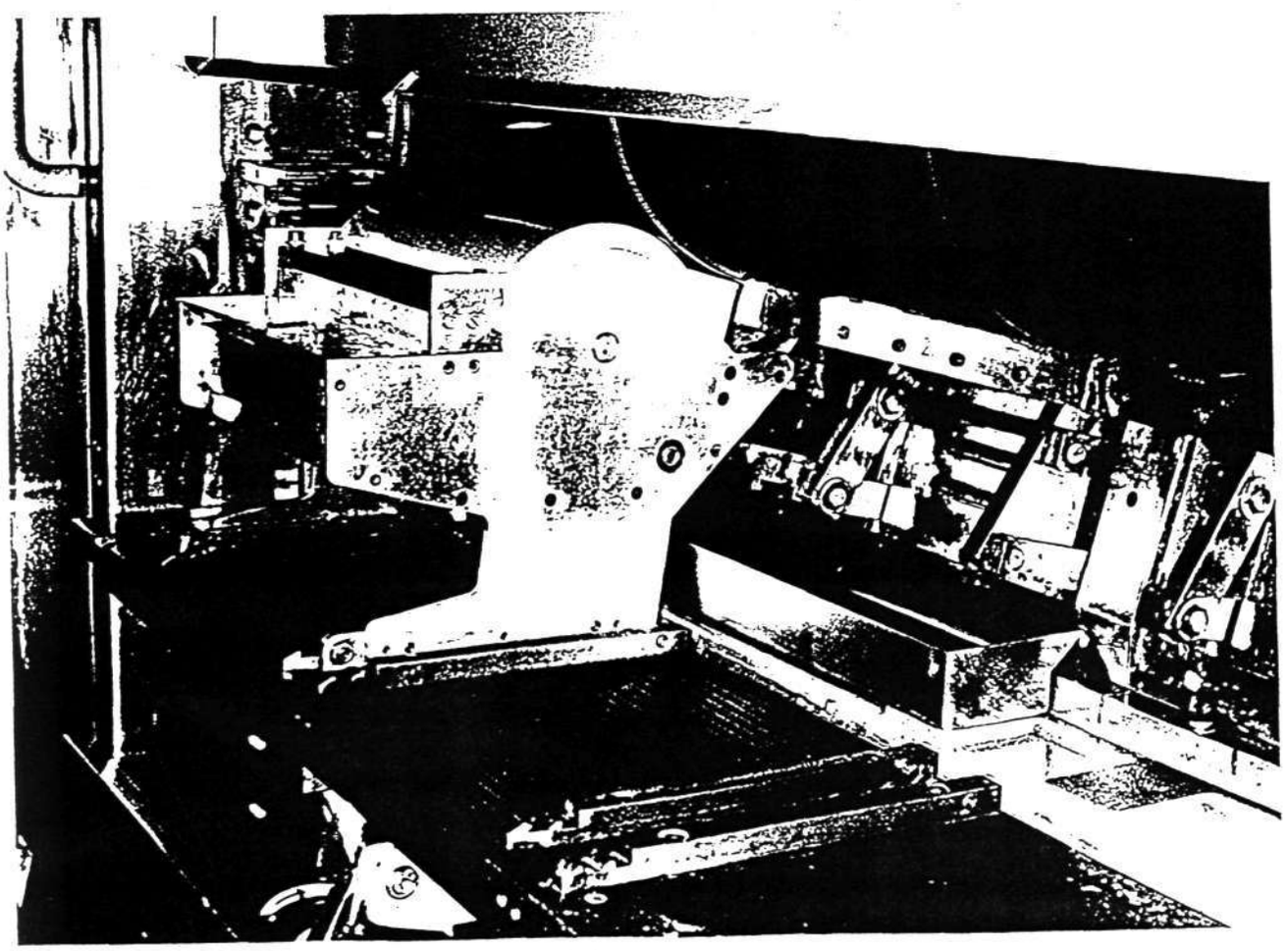
MASCHINENFABRIK
WIFAG



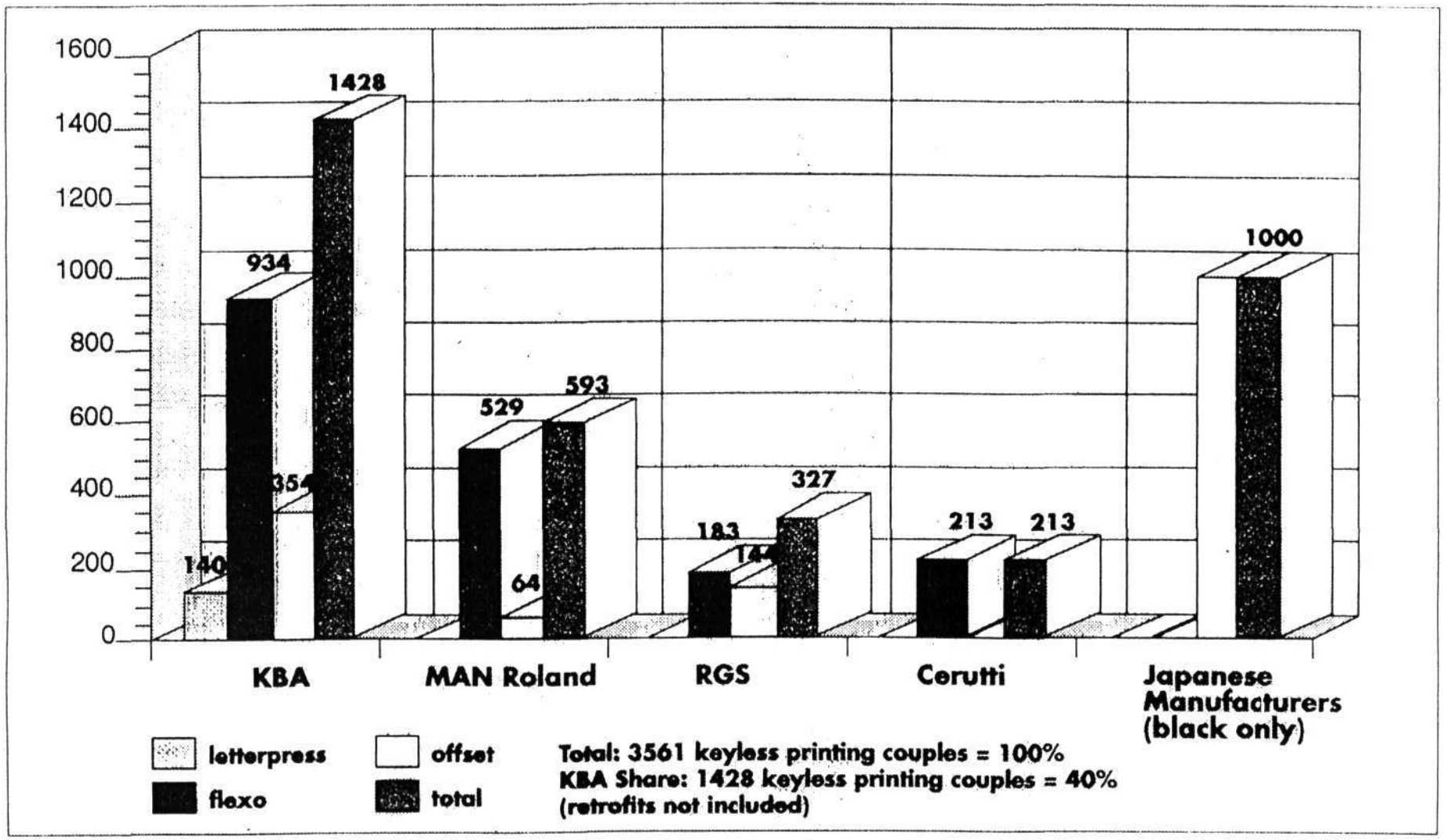
WIFAG OF 370 GTD
klassisches Spaltfarbwerk

WIFAG OF 570 GTD
«keyless», extrem Kurzfarbwerk



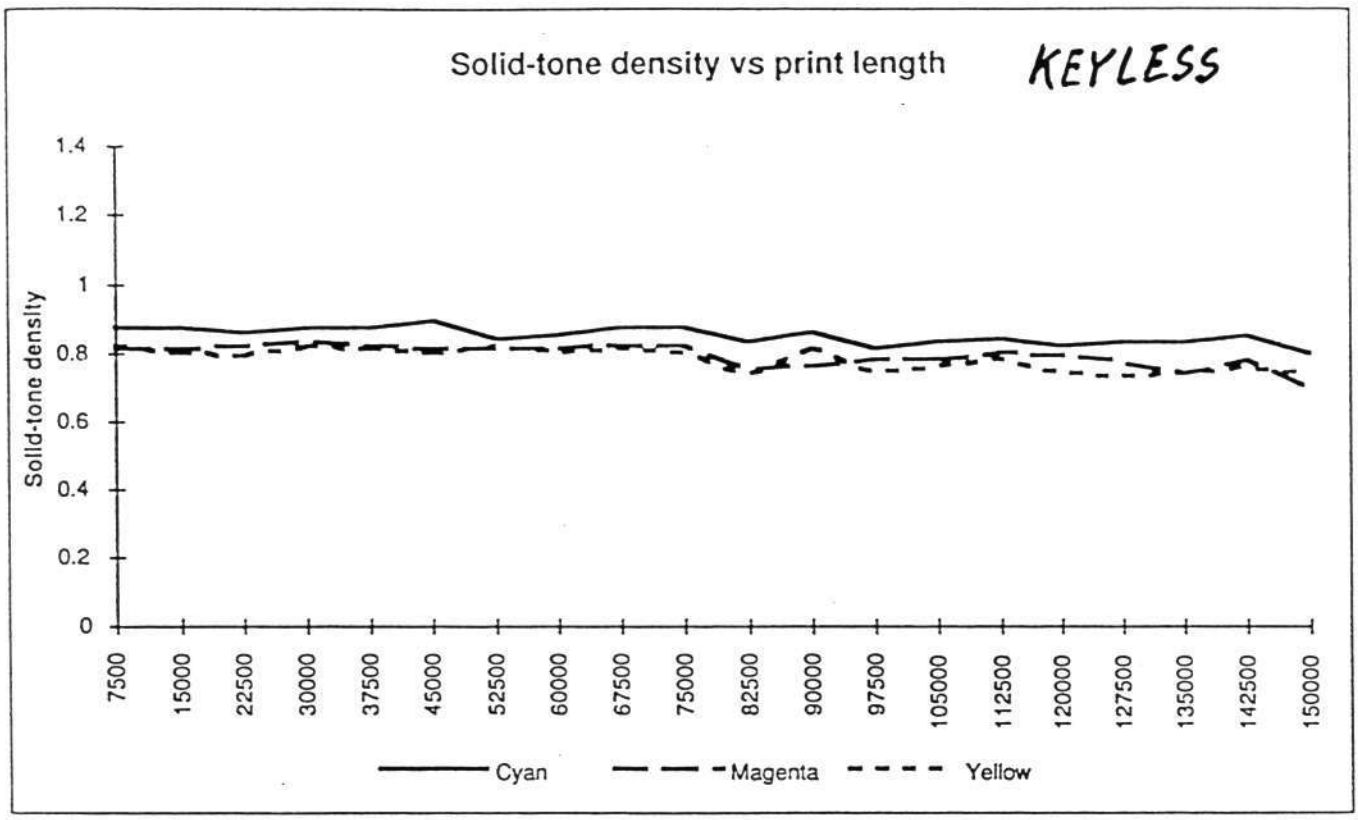
WIFAG OF 570 GTD, Farbkastenbereich

Keyless printing couples sold worldwide

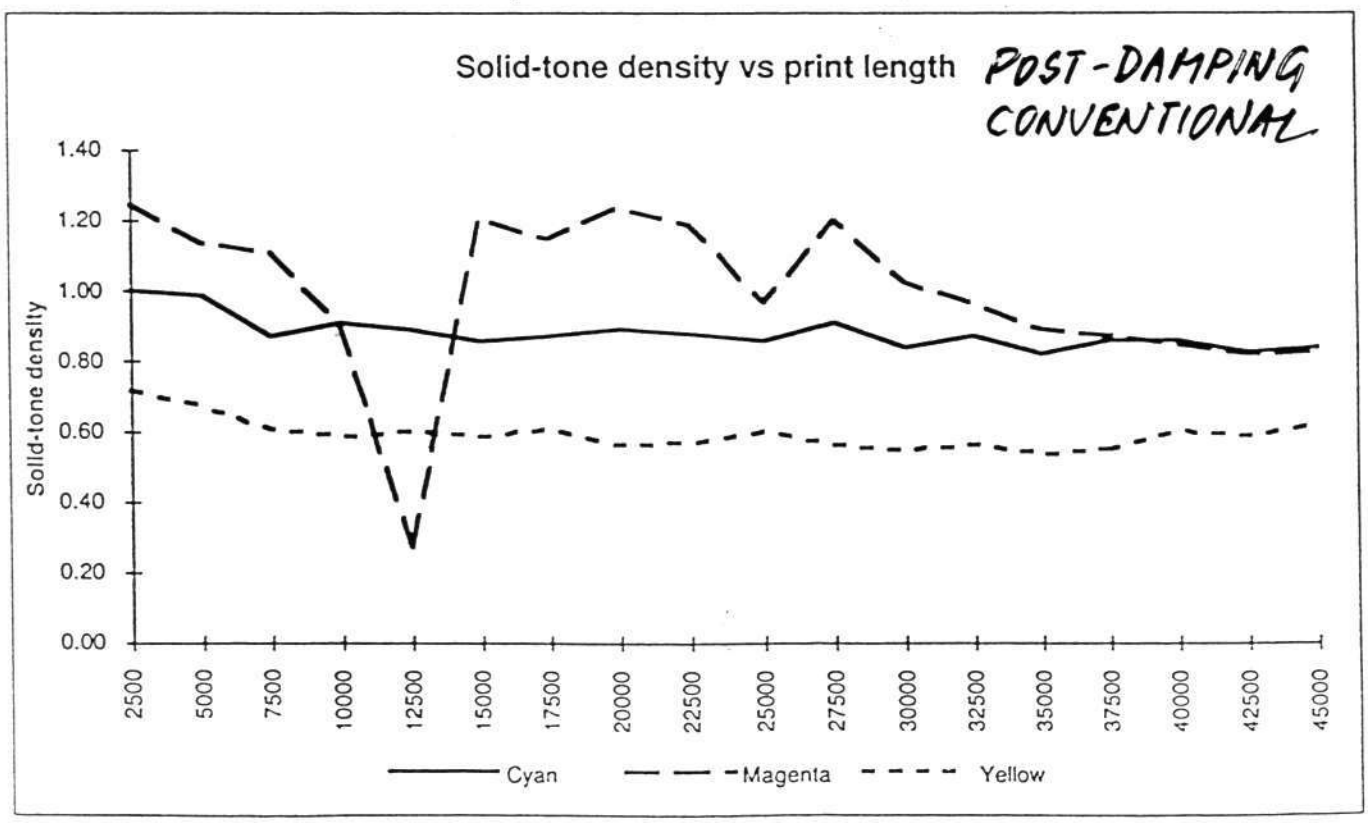


KBA

App. 1. Solid tone density vs print length

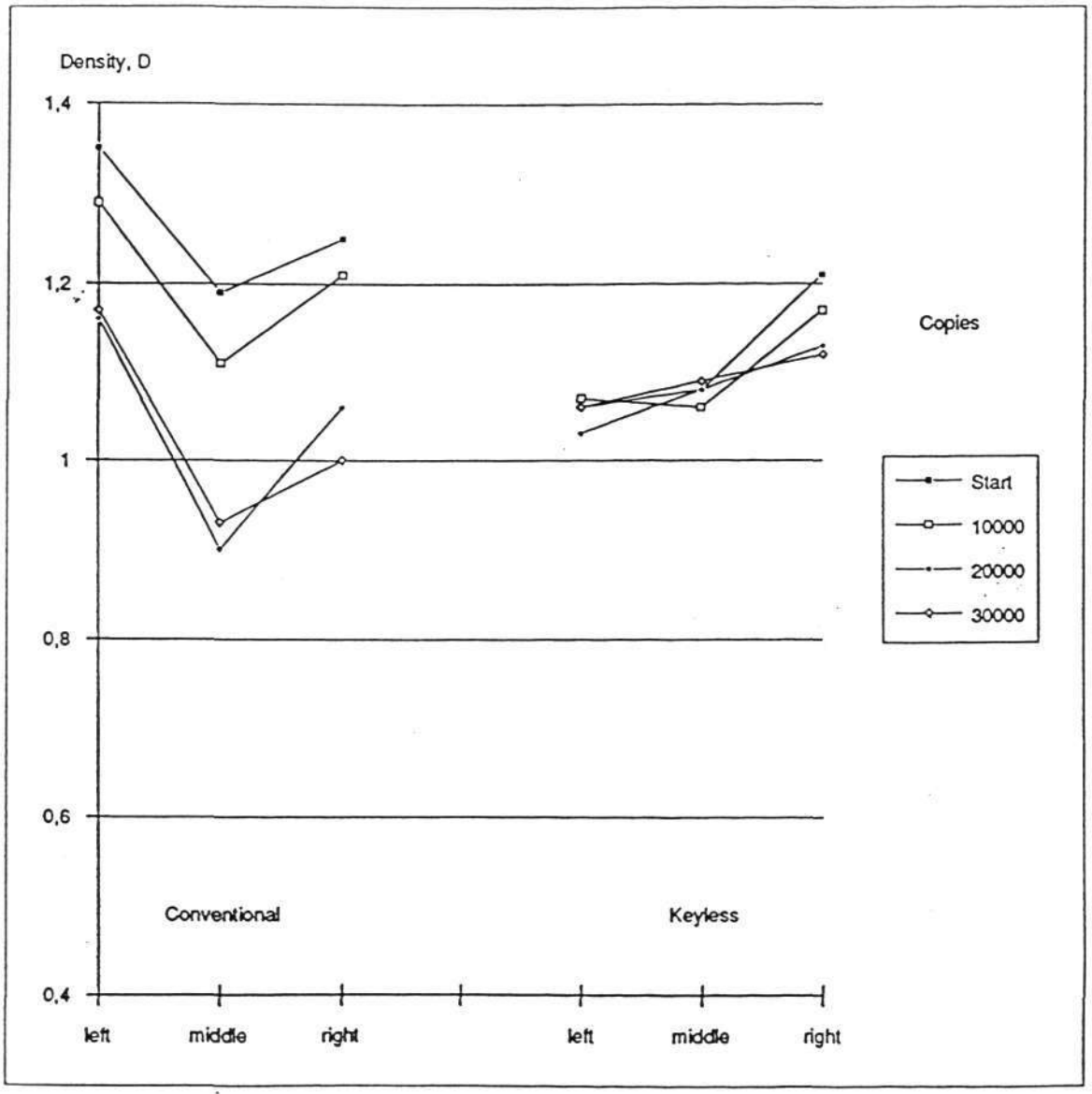


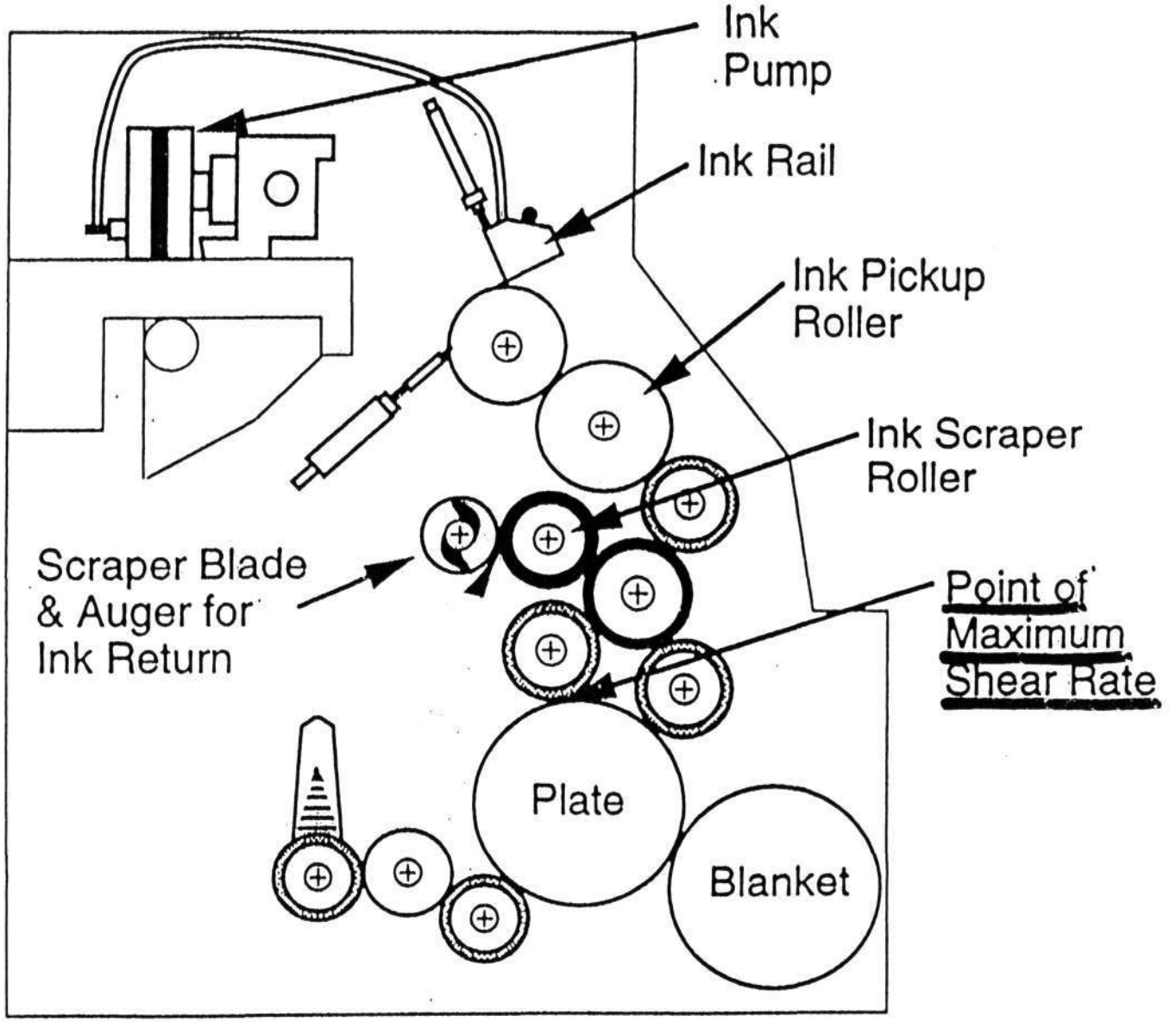
Example of a small variation



Example of a large variation

CONVENTIONAL KEYLESS





Source: Rockwell Graphic Systems.

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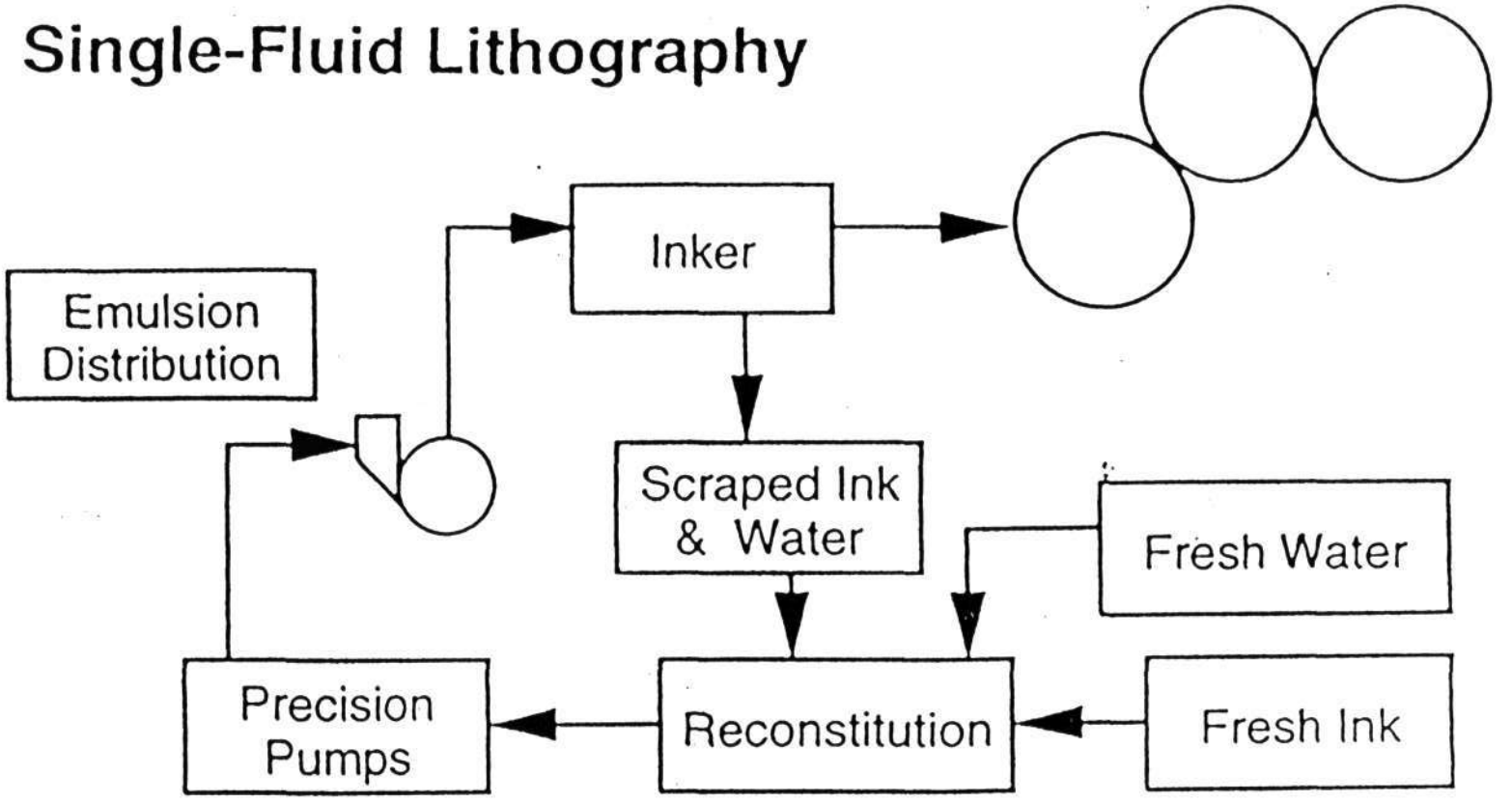
Single-Fluid Lithography



Source: Rockwell Graphic Systems

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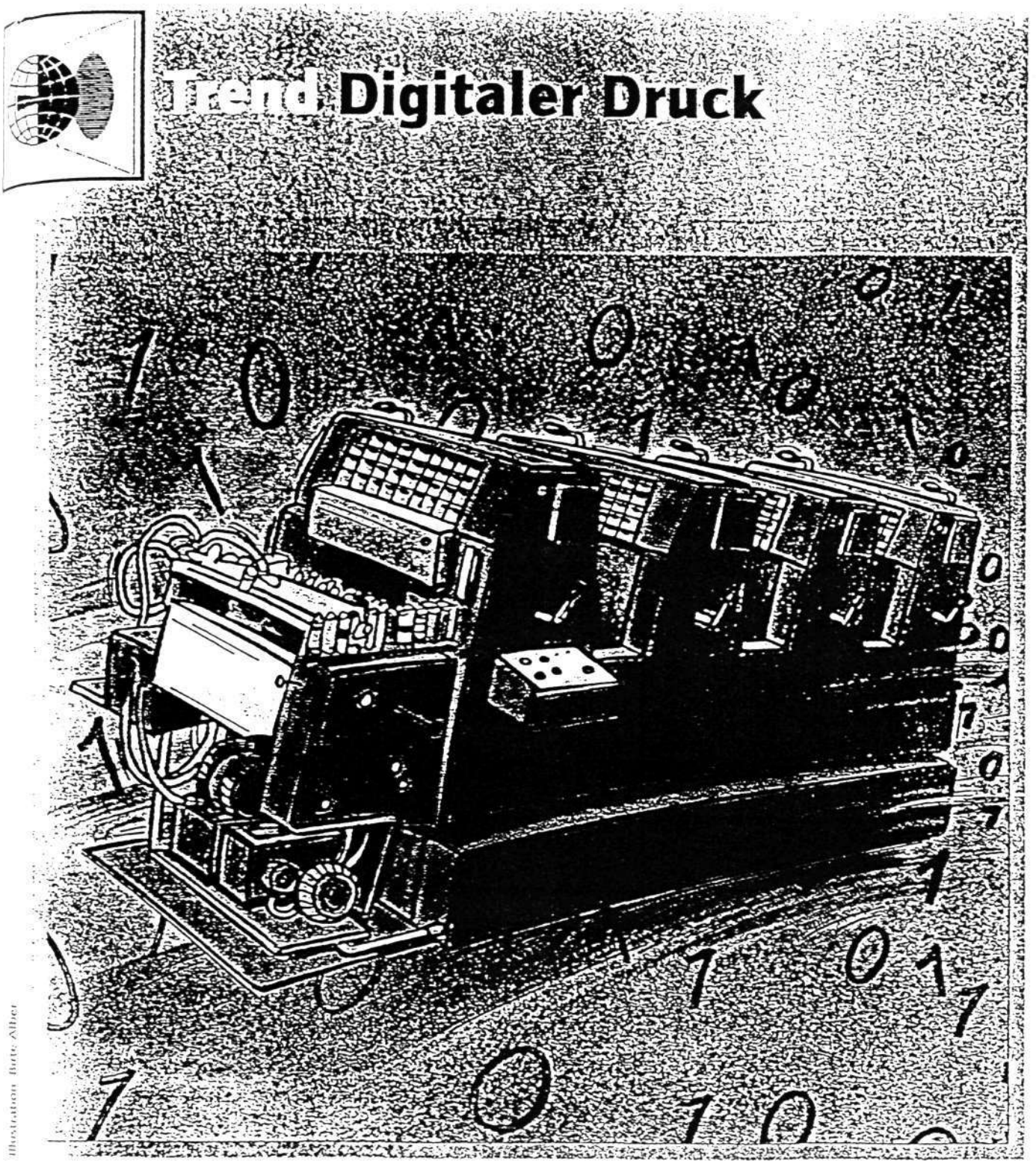
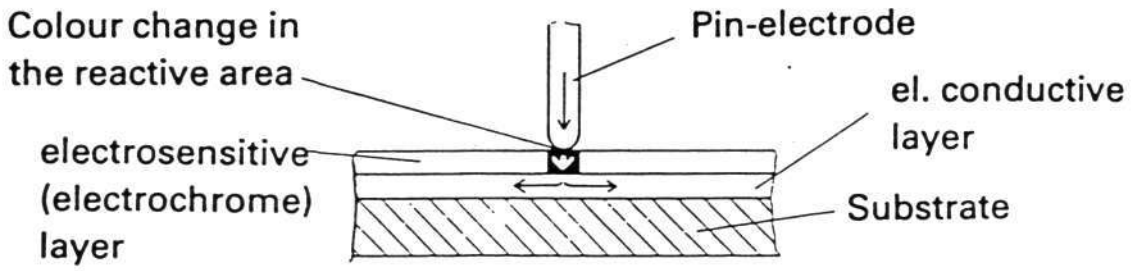


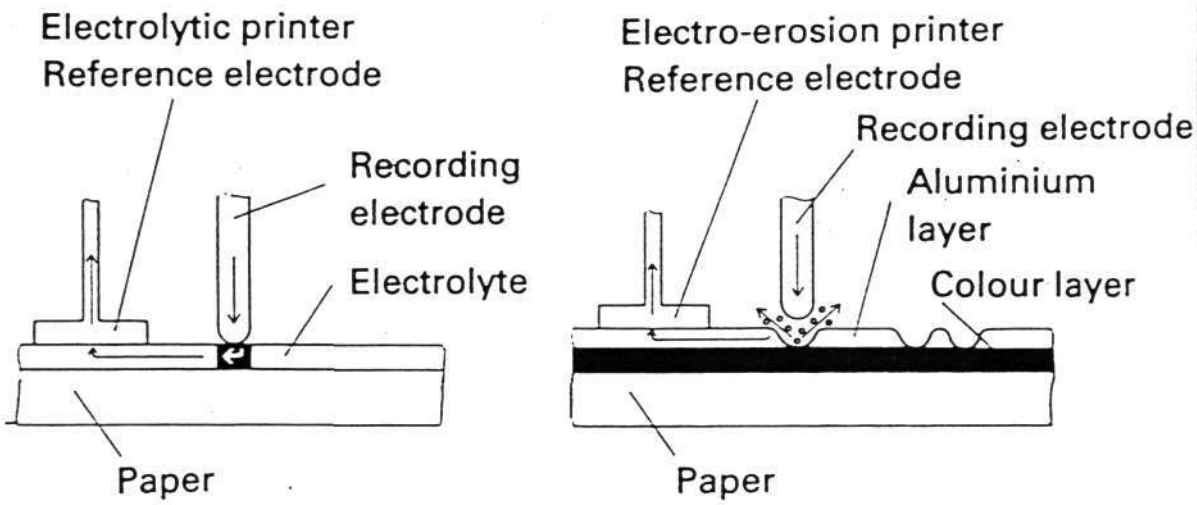
Illustration: Birte Alber

ELECTRO-SENSITIVE PROCESSES

Principle of operation



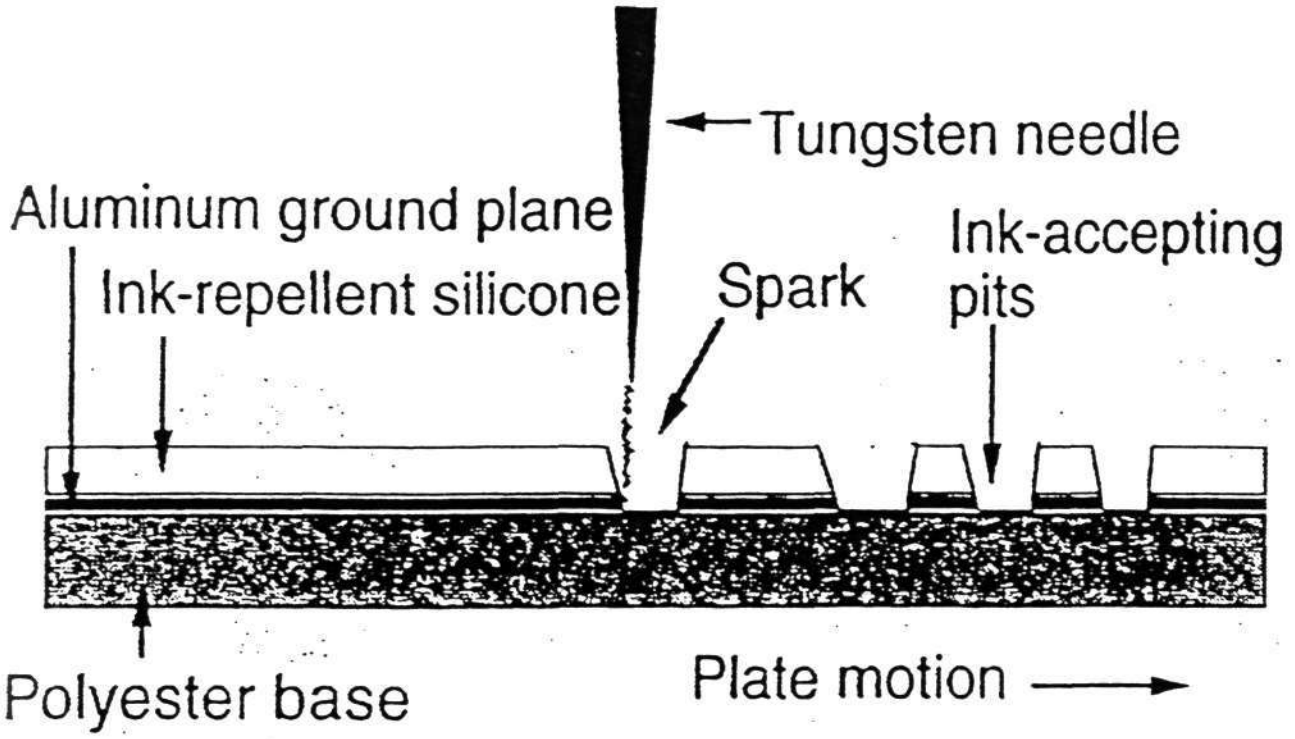
Process variations

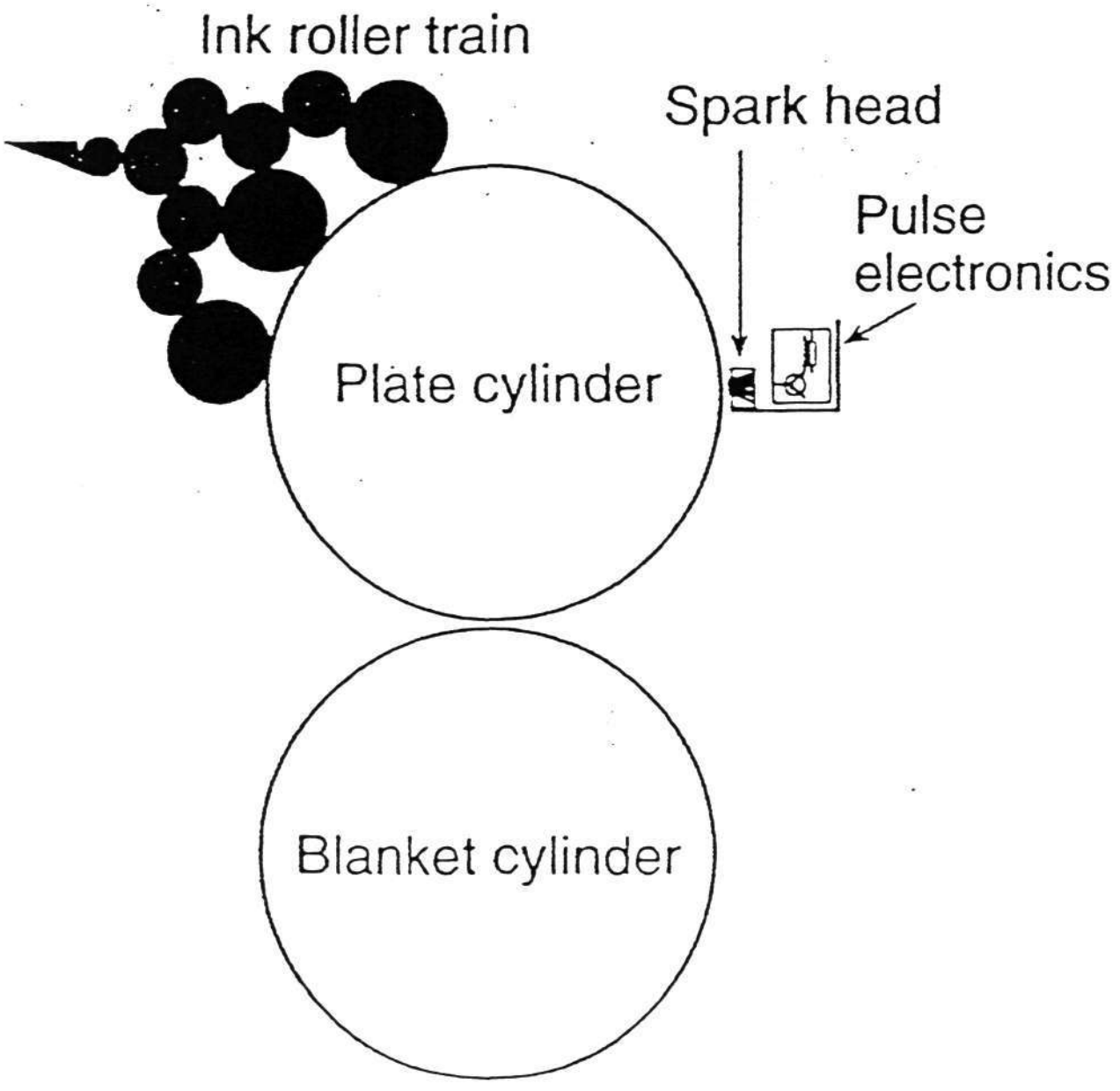


Special developments

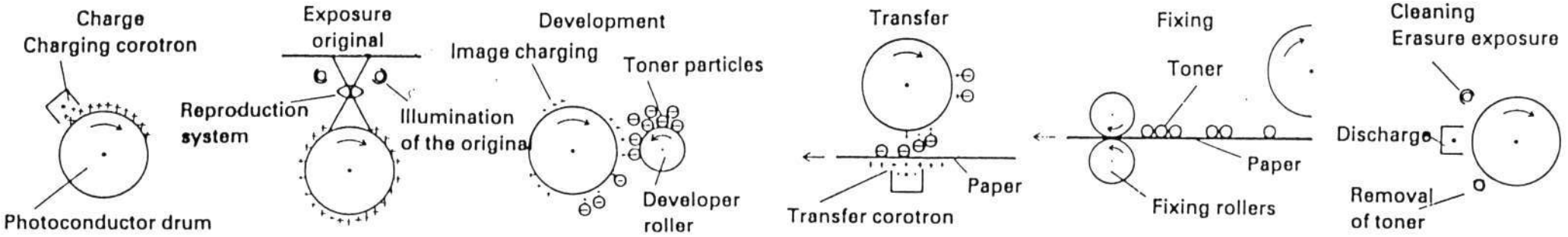
Printer for «normal paper»
The electrolytic coating is carried out on a wet surface immediately before recording.

Colour printer
Selective colour command (Voltage excursion, length of impulse)
e.g. of a four-colour leuco dye mixture.

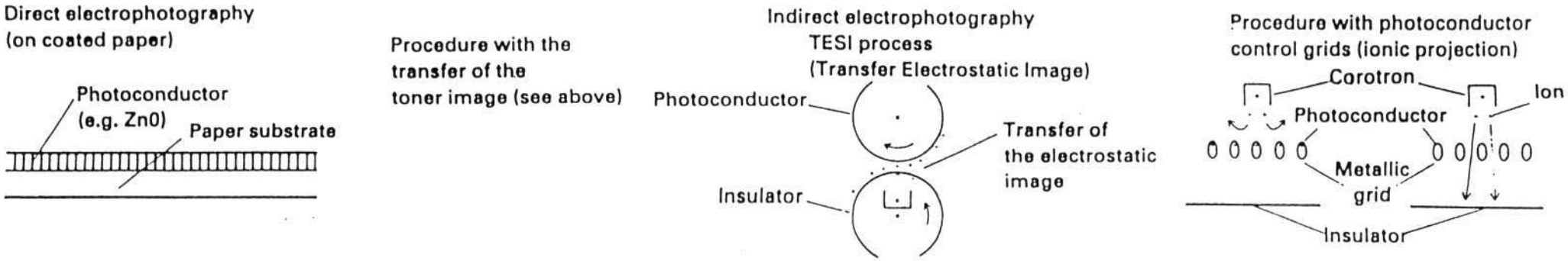




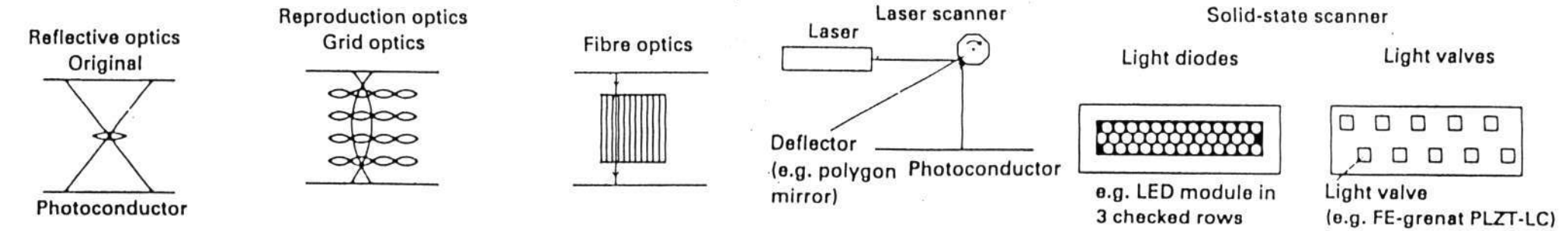
Principle of operation



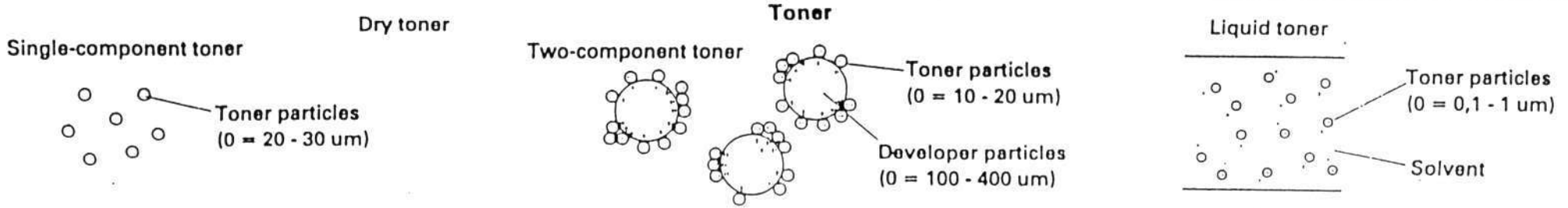
Process variations

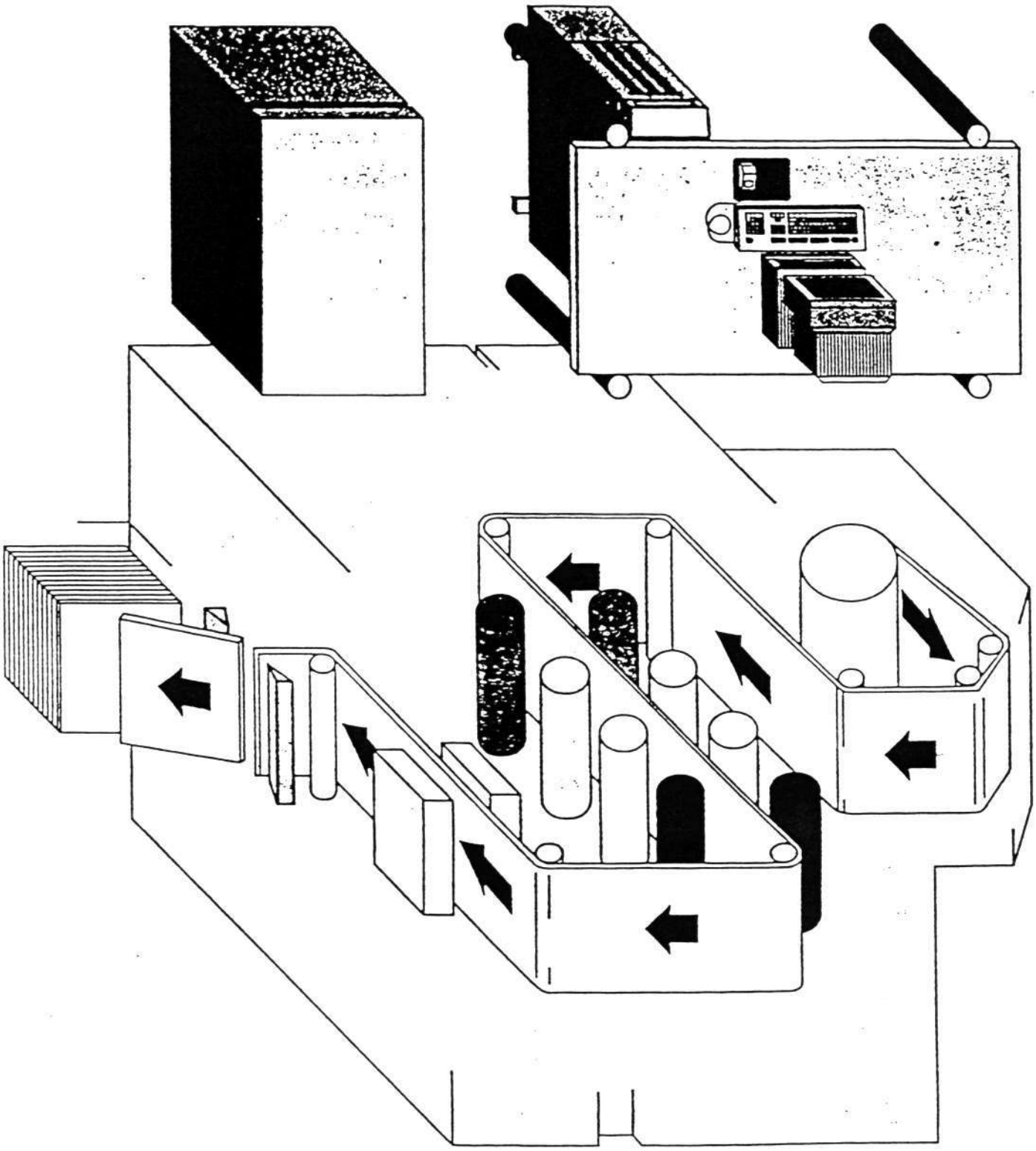


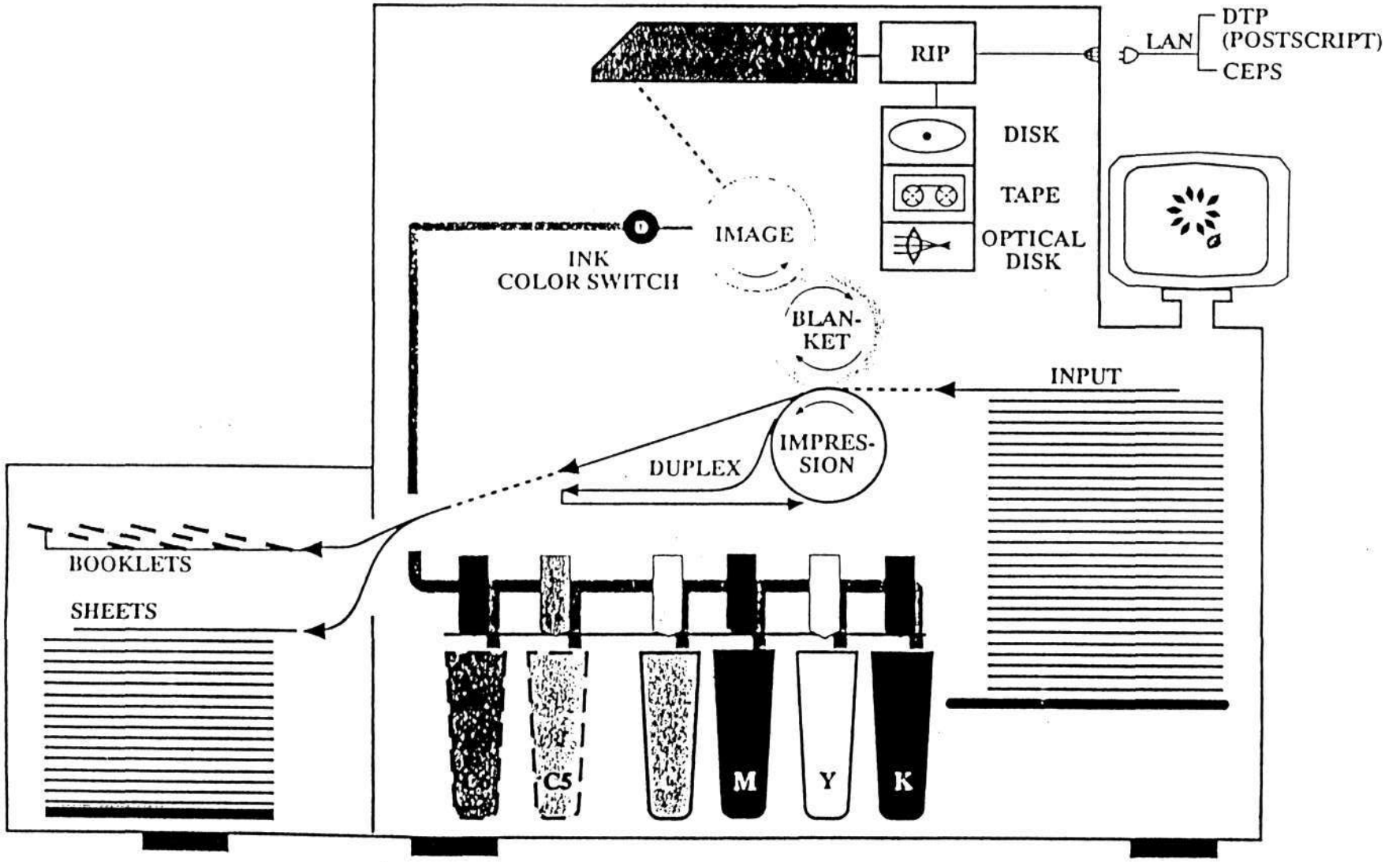
Exposure



Toner

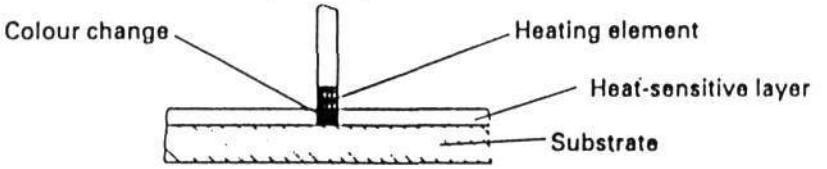






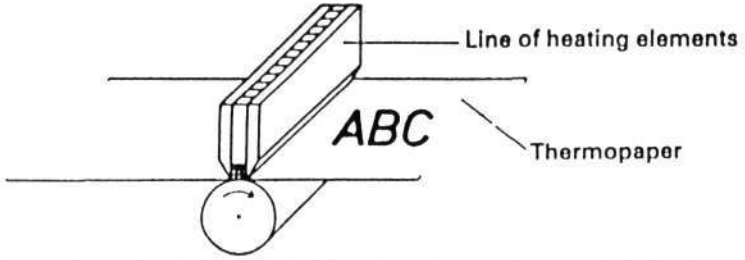
THERMOGRAPHY

Principle of operation

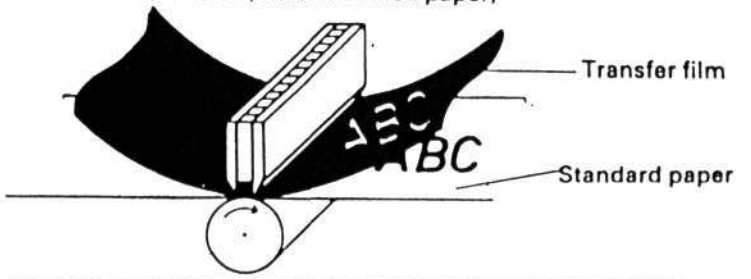


Process variations

Direct thermography (on coated paper)

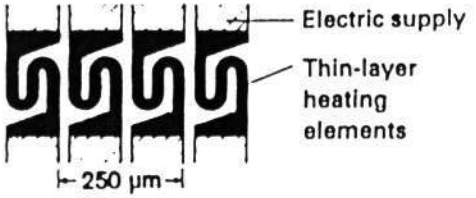


Heat transfer (on non-coated paper)



Printing heads

Heating elements for heat-sensitive materials

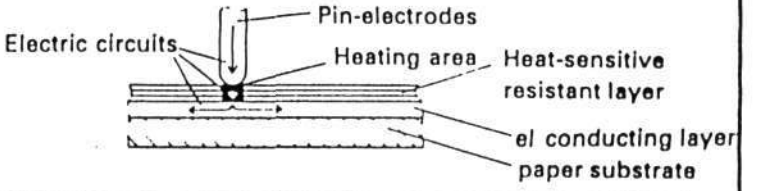


Others

— Hot-air jets

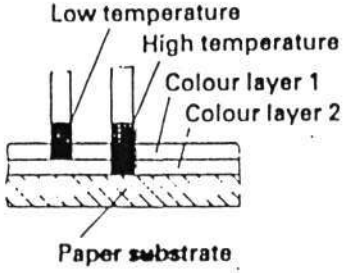
— Radiation heating elements (LED, laser)

Pin-electrodes for electrothermo-sensitive materials

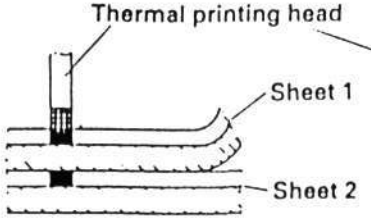


Special layers

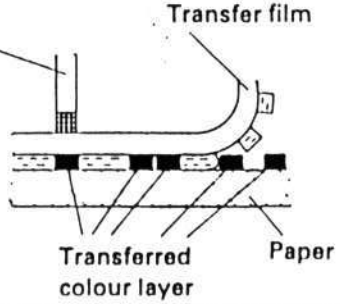
Two-coloured heat-sensitive layer



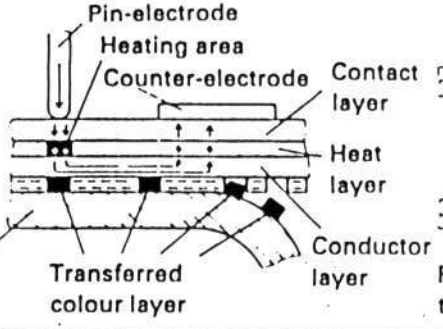
Heat-sensitive carbon copy set



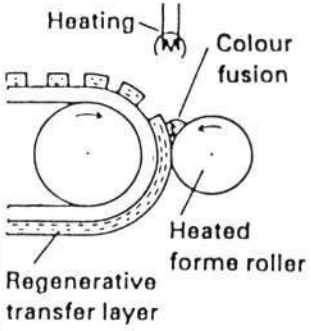
Heat-sensitive transfer layer



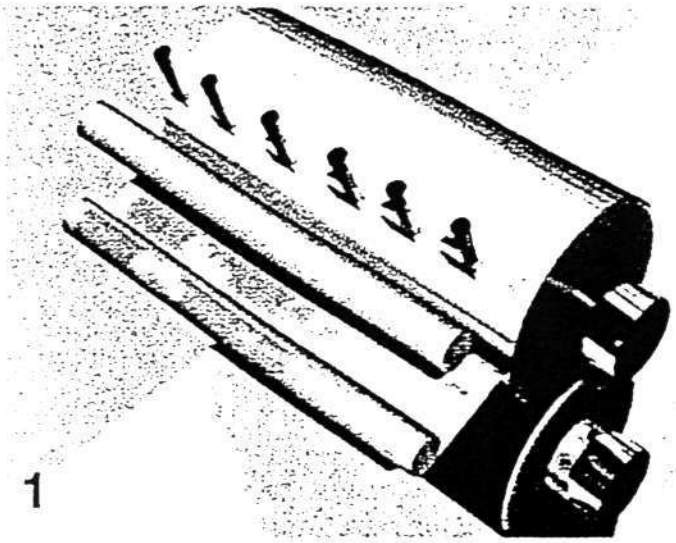
Electrothermo-sensitive transfer layer



Regenerative transfer layer



Digital job changes in Offset



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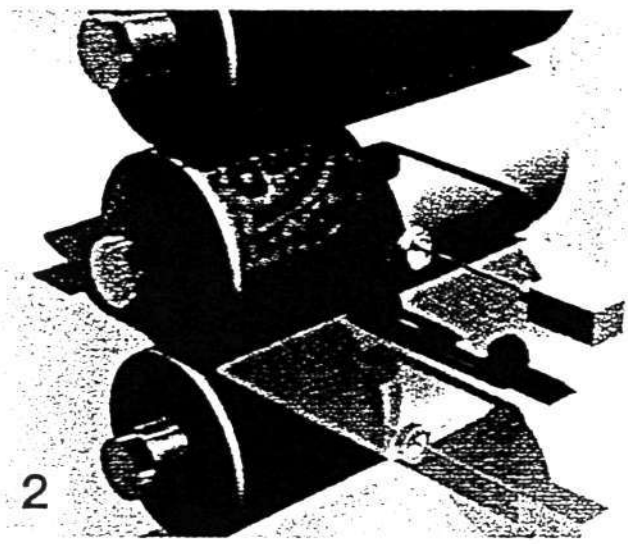


2

The direct thermal transfer process

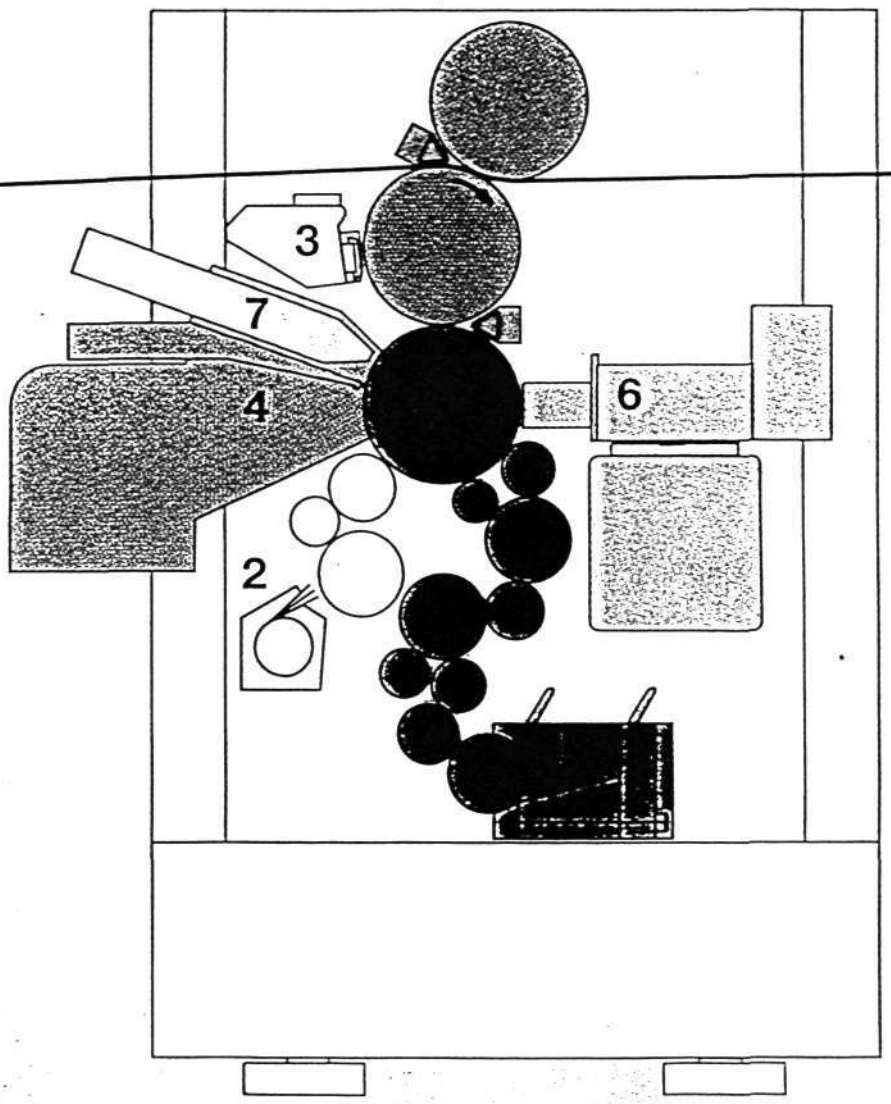
To erase the previous job and prepare them for further imaging the rotating forme cylinders are cleaned by means of a sprayed wash up solution and a cloth (1). The blanket also is cleaned.

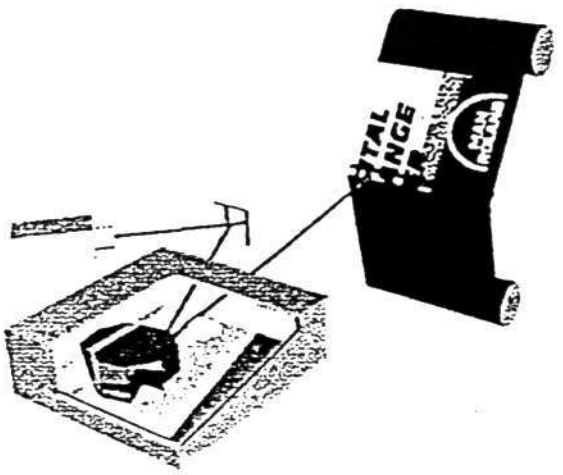
The blank cylinder is imaged directly from the data set. Based on the out drum principle a polymer on a narrow support is imagewise transferred by laser-induced therma transfer.

The laser imaging system with 64 channels has been especially developped for MAN Roland by CREO. Imaging time is about 5 minutes for an A3-size and a high resolution of 2400 dpi. The size of the imaging dot is 11 µm. Printing can begin without any chemical step immediately after fixing.

MAN ROLAND

DICOWEB LITHO





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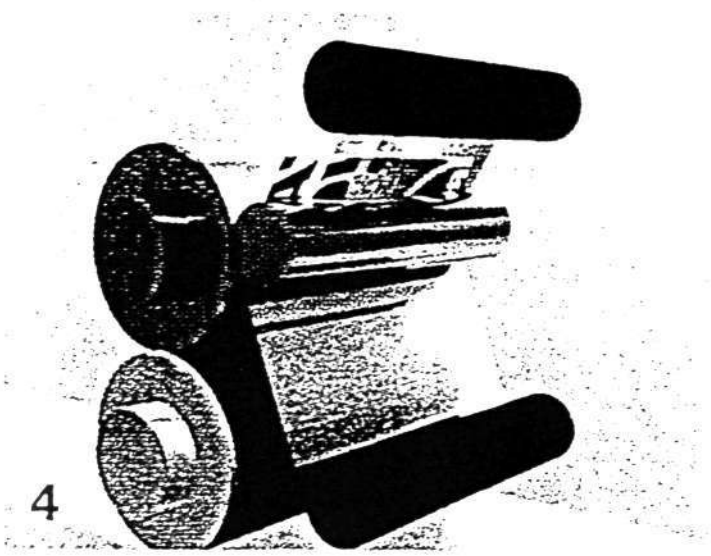
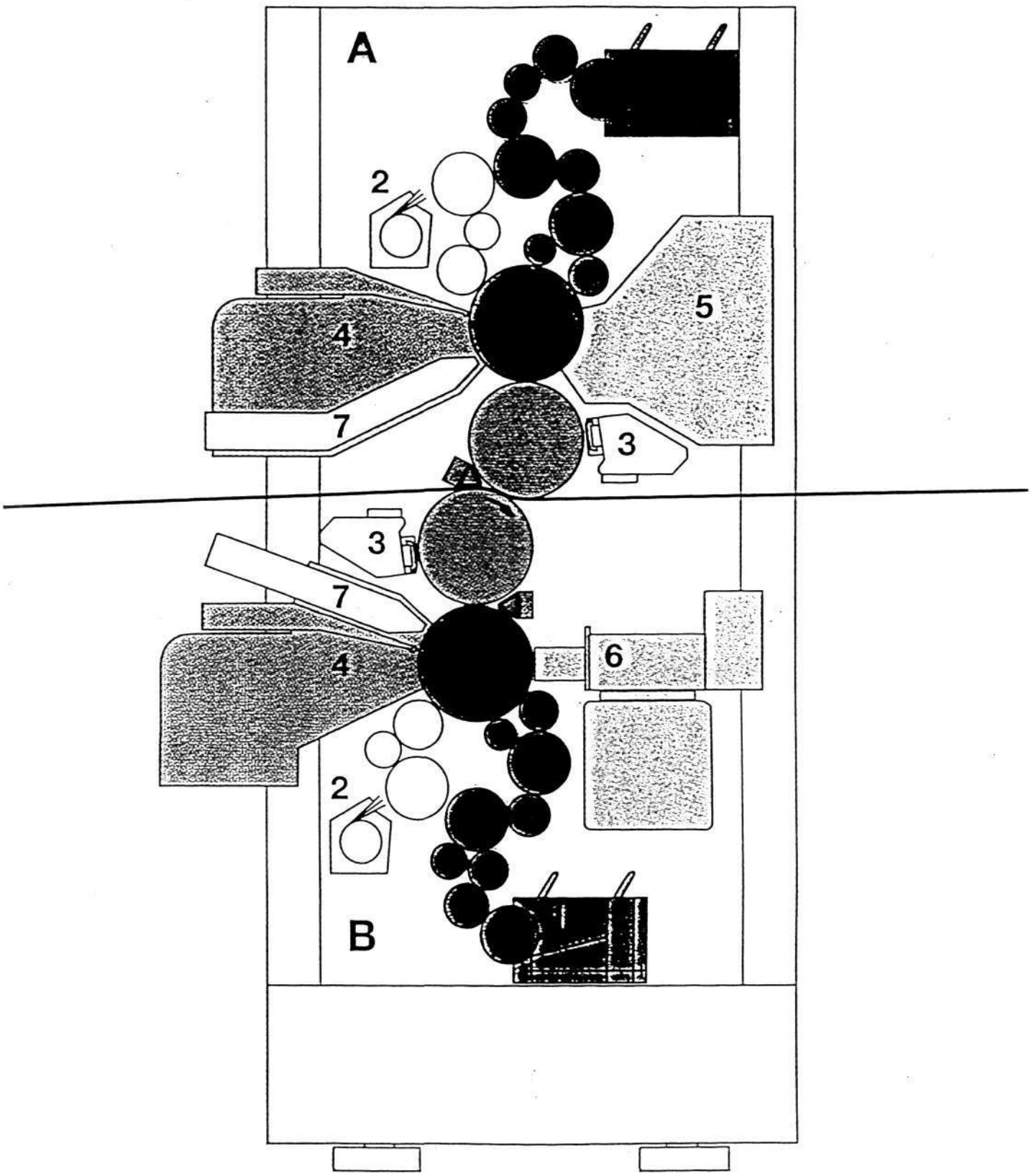


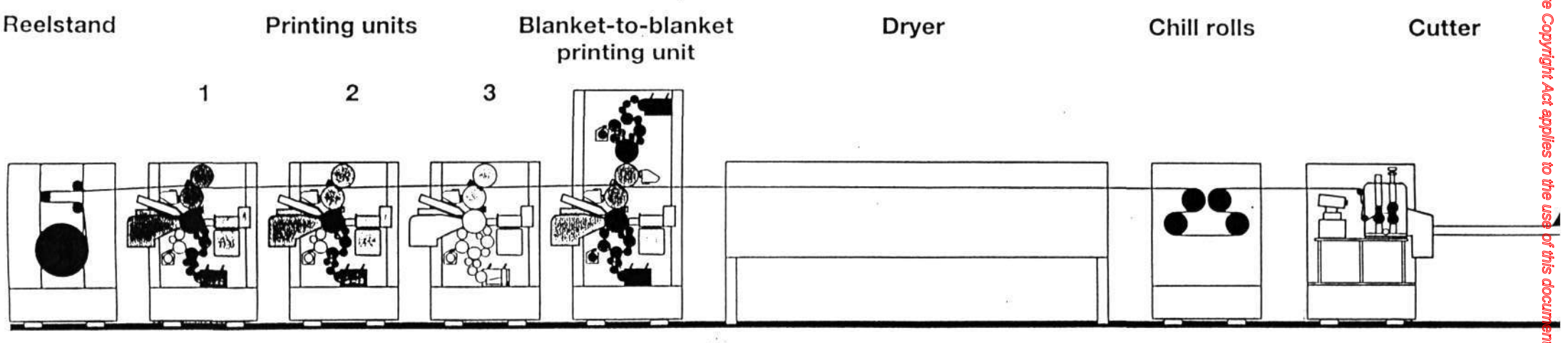
4

The two-step thermal transfer

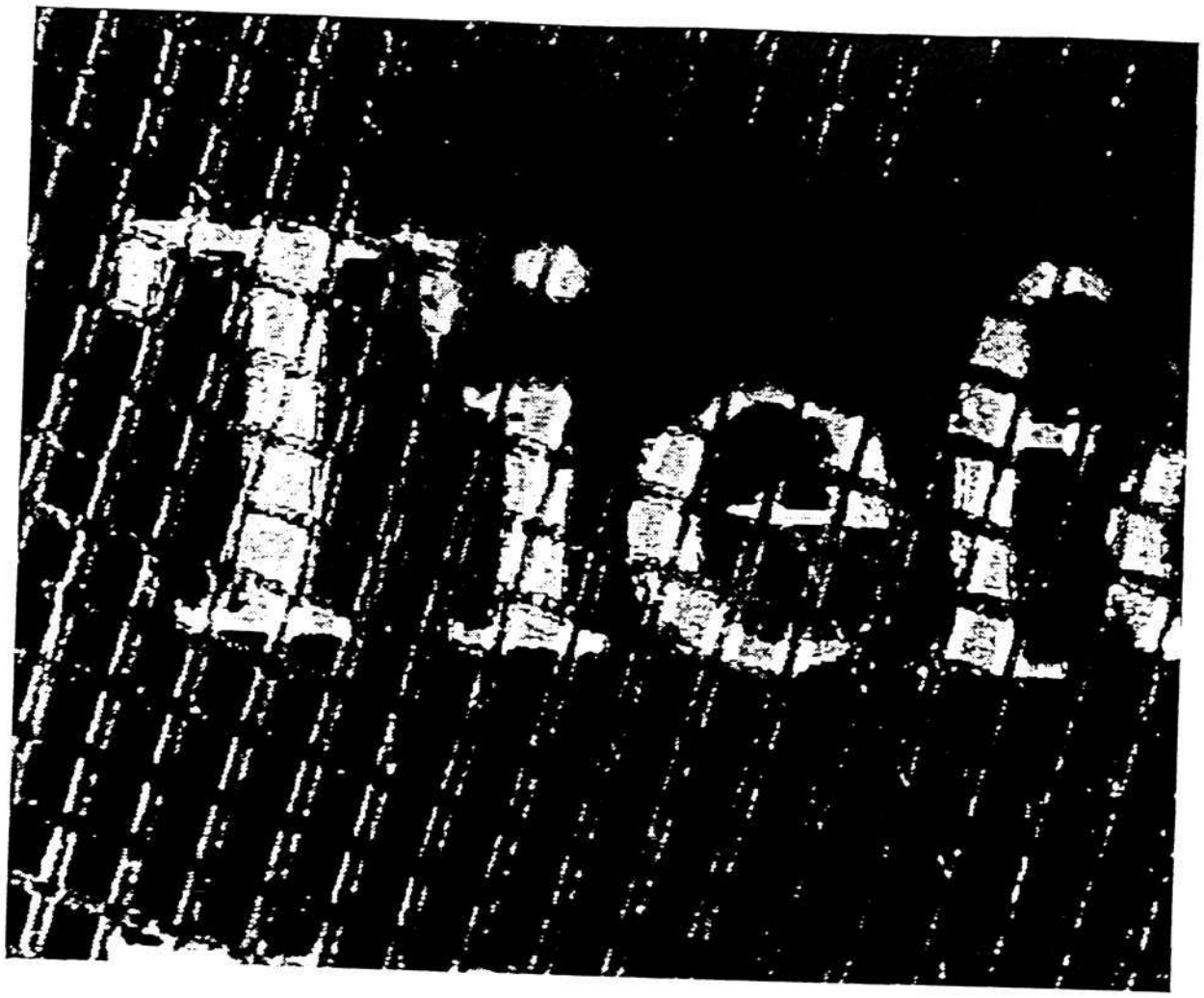
By means of this less costly process a support layer is imaged while printing takes place (3). This layer is thermically transferred onto the cylinder when the job is changed (4).

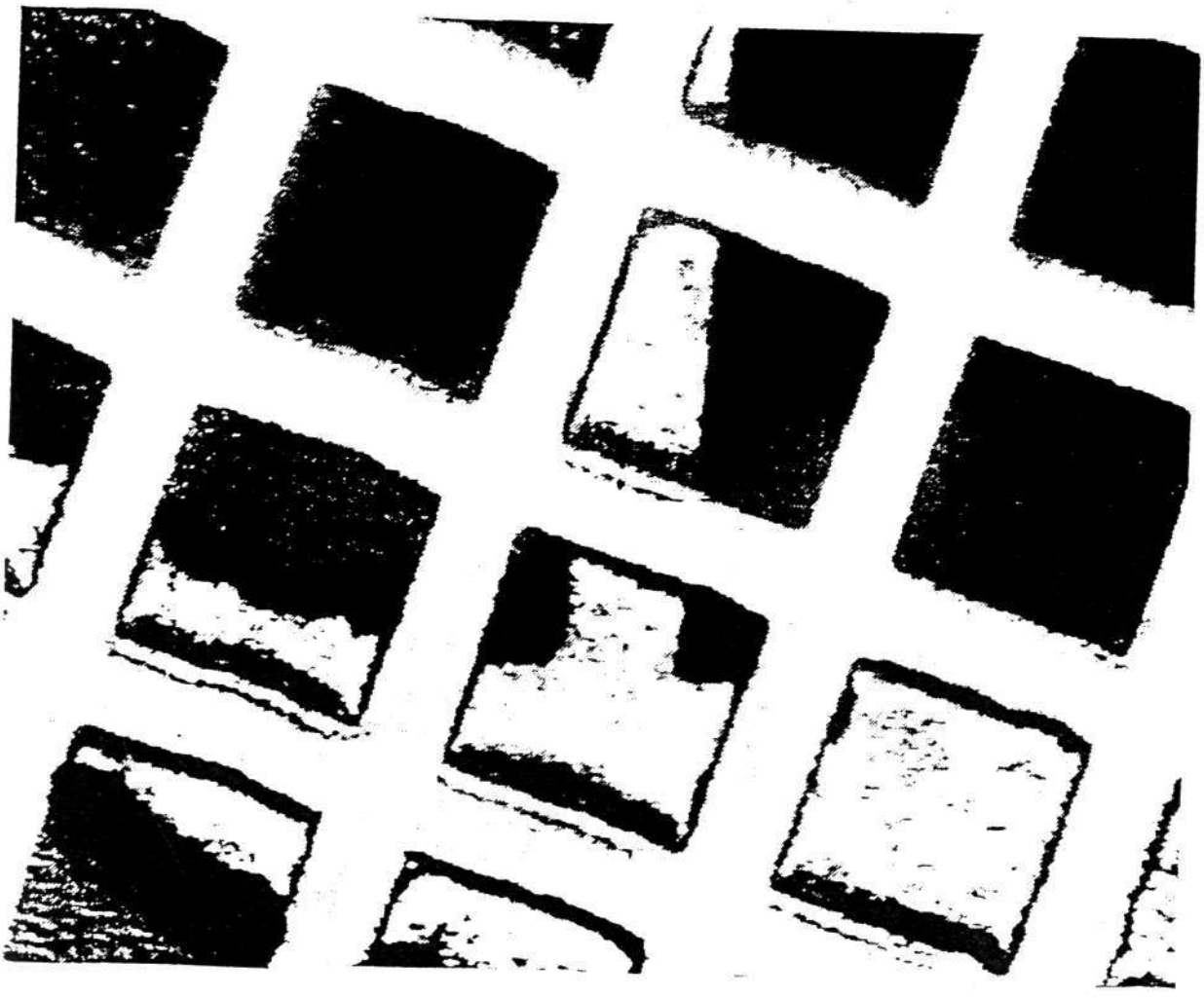
Several jobs or complete sections can be imaged on a foil. Thermic transfer takes 25 seconds each time.





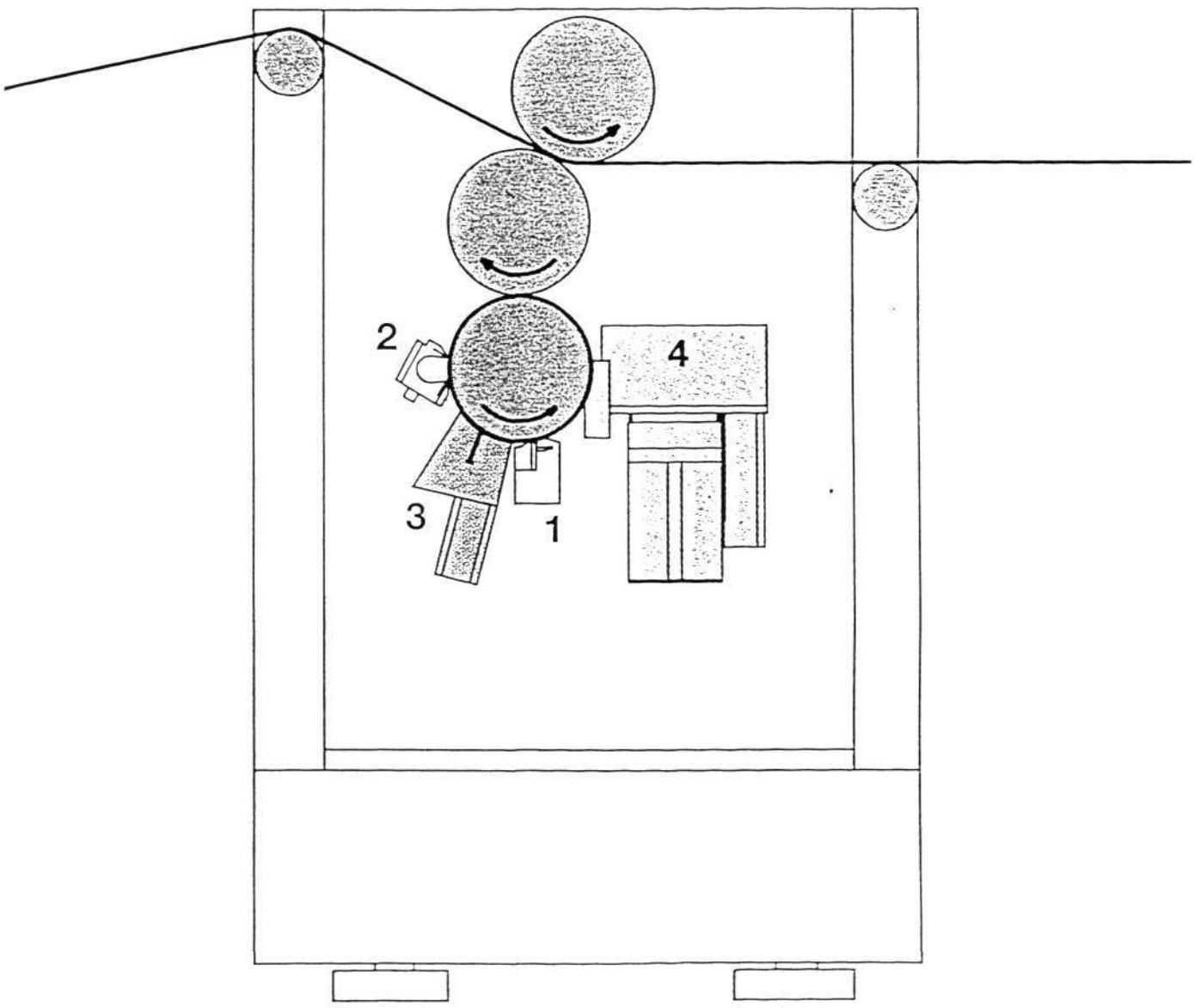
2

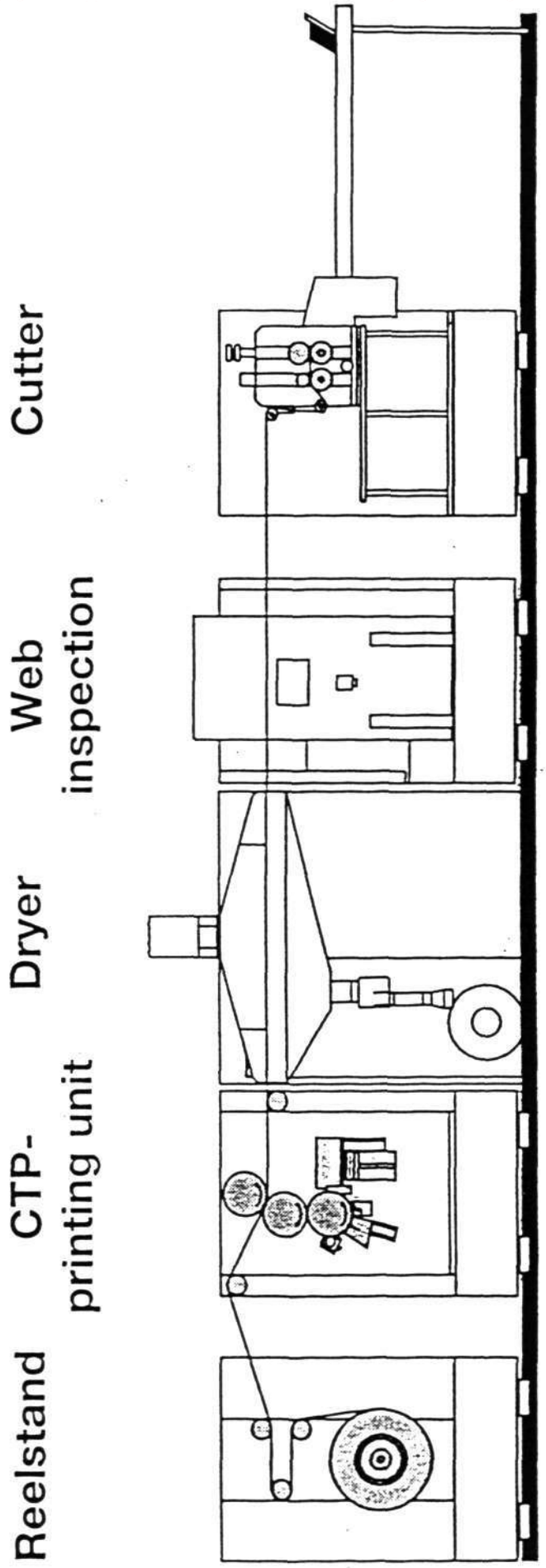




MAN ROLAND

DICOWEB GRAVURE

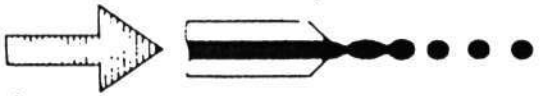




Principle of operation

Driving principles

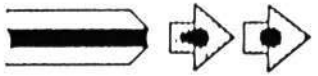
Continuous jet



High-pressure
(pump)

Pressure impulses
(e.g. piezoelement)

Interrupted jet
(Drop On Demand = DOD)



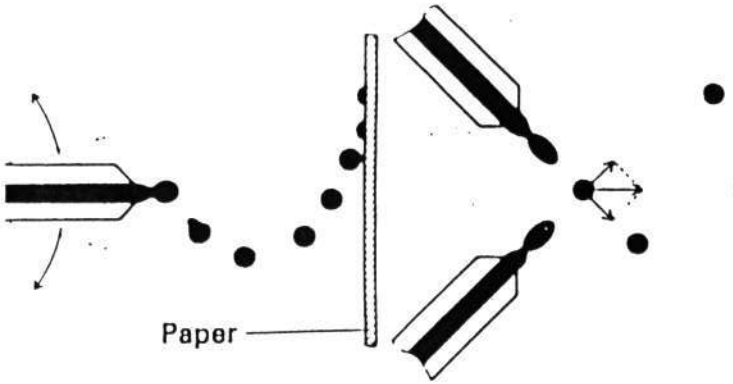
Draw impulses
(e.g. counter-electrode)

Deflective principles

Mechanical

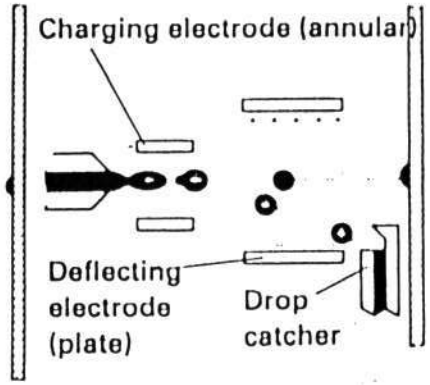
Oscillating jet

Drops collision

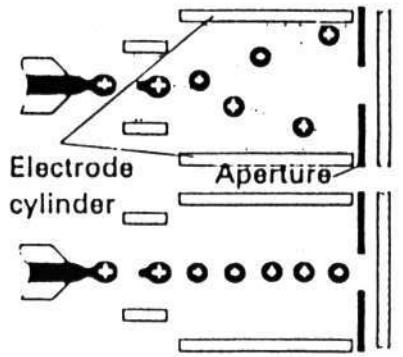


Dispersion electrodes

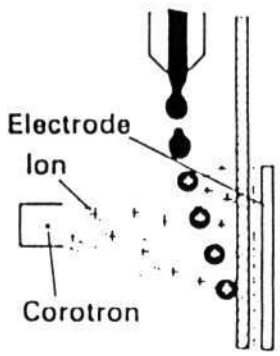
Electrostatical



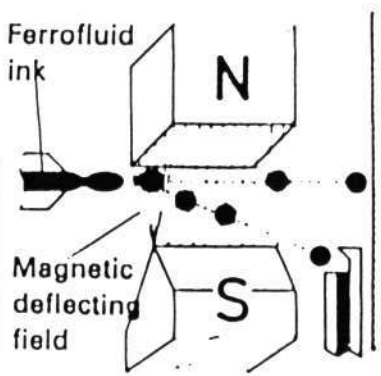
Deflecting electrodes



Ionic spray projection

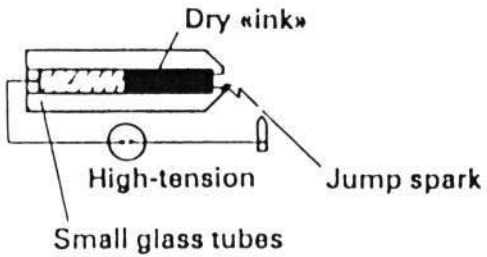


Magnetic

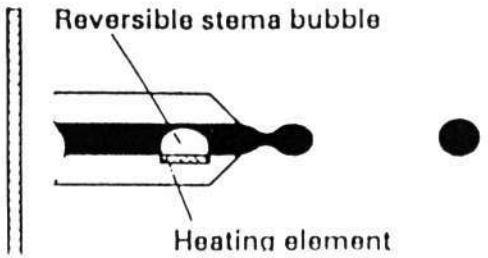


Special developments

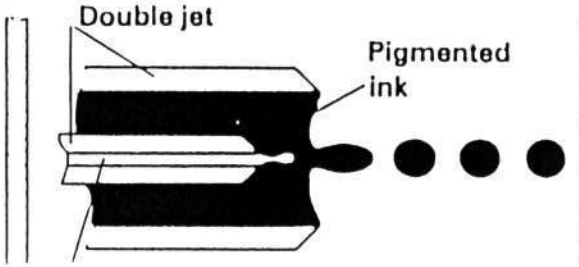
Dry ink jet (Spark Jet)
Olivetti



Bubble Jet
Canon



Coumpound Jet
Hertz



Microdot
Hitachi