Rotary letterpress printing

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Minimizing of unproductive time and establishment of continuous working processes are sought in all fields of technology as a result of rationalization efforts. In printing technology this means more and more switching to the rotary principle as far as possible and sensible. Compared to the progress made in gravure and offset processes, letterpress has lagged behind partially during the past years. Intensive rationalization efforts in the letterpress field promise a rapid improvement of this situation. The problem is primarily the obtaining of qualities on (sheet fed) rotary letterpresses which so far seemed to be the exclusive prerogative of high speed presses and, without undue cost. Specially qualified printing forms on correspondingly designed (sheet-fed) rotary letterpresses have already brought this goal much nearer. New type printing plates (already) have given excellent results.

On (sheet-fed) rotary letterpresses it is possible to use about 4/5 th of the machine time for the actual printing process. This means an increase in productivity of more than double that of ordinary two revolution presses at the same press speed. (It should be said that we have a rotary letterpress process also in a two colour high speed press in which a curved printing form works in conjunction with a printing cylinder. This means merely the simultaneous printing of a second colour. The working speed of the machine remains that of a high speed press. However, performance is doubled because a second printing cycle is eliminated.) The advantages of rotary letterpress (sheet-fed) are noticeable especially for higher print orders of about 20 000 units and upwards as well as for wet-in-wet printing. Multicolour machines can be assembled from individual printing units according to the building-block principle. Modern rotary letterpresses reach working speeds of 8 000 - 10 000 sheets per hour. In order to achieve sufficiently smooth and correct feed, the machines are generally equipped with staple feeders.

Operations not directly concerned with the printing process proper should be carried out so as not to interrupt it. Therefore, high volume stapling units are used or staple feeder operations without work interruptions of the machine, this applies also to the delivery end of the machine. Exchangeable cylinders in conjunction with suitable make-ready machinery can reduce standing time in (sheet fed) rotary letterpresses very considerably. By using highly pigmented inks fed to the printing form over a system of highly developed inking units with rapid and intensive "ink distribution" as well as by means of accurate sheet guidance over transfer drums it is possible nowadays to achieve high qualities of multicolour wet-in-wet printing. Longer transfer zones, in some cases with suitable drying systems - especially on perfector machines - assist in speeding up of ink drying between individual printing units.

In certain drying systems (f.inst.gas heating) static electricity is removed from paper and with it corresponding printing difficulties. Longer delivery distance assists in obtaining better stapling characteristics of freshly printed products. Faultless delivery of printed sheets can further be achieved by using delayed chain delivery gripper speed and pneumatic sheet slow down. For economical reasons slip sheeting is, as a rule, no longer practiced to-day, not to mention the fact that it would be very difficult at high working speeds. If necessary, powder spraying may be used. A very thin powder layer enables outside air to penetrate the staple and to reach the printed picture thus assisting in the quick setting (drying) of ink. By such measures the disadvantages of relatively short intervals between printing, delivery and stapling of the sheets that follow one another can be overcome. Suitable quick setting inks can bring further relief.

Oil proof sealing of drive elements, central lubrication, controls for missed and double sheets increased operating safety and handling of the machine is considerably simplified by push button control, well arranged control elements, easy access

to essential parts - especially the form cylinder as well as through roller wash devices, etc. These factors contribute at the same time to an essential reduction in standing time.

Intensives research was conducted in the field of curved printing plates in an effort to making letterpress rotaries competitive with comparable machines of other printing processes. The printing form is the decisive element of design.

It appears that stereotype plates are too heavy and too costly even if using exchangeable cylinders. The necessary tension and adjusting devices of the form cylinder are relatively complicated, even if tension locking devices are used. Necessary curved plates in the form of wrap-around plates will, within the forseeable future become generally available. Use of one step etching machines in printing plants is increasing rapidly; however, the large plate sizes necessary in practical operations are not yet available. Metal plates as well as synthetic plates (Nylon, Dycril) are under development. Extensive tests have been conducted with plates of 0,8 to 1,0 mm thickness. The relatively shallow relief of these plates calls for inking units of special performance; it is possible, nevertheless to utilize experiences made with inking units on machines of indirect offset (or dry offset). After through training of workers, accurate mounting and registering of large printing formates should not prove too difficult because similar difficulties have been satisfactorily solved already in other printing processes.

Further it may be said that the sheet fed rotary letterpress due to its continuous working principle ~~and~~ (beginning at a certain print order level) can, if compared with flat bed letterpresses, contribute considerably to the rationalization effort by reducing unproductive time with the help of special feeder staple change systems and continuous sheet delivery as well as by profiting from short make-ready, easy operation and advantageous maintenance. It also facilitates the transition to multicolour machines.

The spread of the (sheet-fed) rotary letterpress machine is conceivably a question of print order size and capital investment as well as one of curved plate forms which can guarantee high printing quality. Judging on the basis of present developments it can be expected that this machine type will soon be in serialized production and will be used more and more.