This invention relates to sheet gripper mechanisms employed in rotary sheet handling machines and particularly sheet printing machines: for convenience, reference will be made only to rotary printing machines in what follows.

Such machines employ one or more impression cylinders equipped with sheet grippers which take hold of a sheet and carry it around with the cylinder during which time the sheet receives a printing impression: such a cylinder has strained about its periphery an impression sheet which can be of various materials selected to provide a support to the paper sheet during the impression: such impression sheets are in the form of blankets and are commonly referred to as such and this term will hereinafter be employed.

The blanket is strained about the cylinder by attaching its ends to mechanisms which are necessarily housed in a recess in the body of the cylinder: the gripper mechanism is also housed in a recess in the body: the blanket must extend to support the paper sheet to a point close to its leading end where it is engaged by the gripper fingers of the gripper mechanism: in the result therefore, the gripper operating mechanism is positioned close to and in front of the straining mechanism for at least the leading end of the impression sheet.

The blanket has to be replaced from time to time and to do this it is necessary with the known constructions to dismantle more or less of the gripper mechanism to enable the leading end of the blanket to be introduced into its recess, there to be engaged by the straining mechanism.

This is a time-consuming operation and results in disturbing the somewhat precise settings of the various parts of the gripper mechanism.

It is the main purpose of this invention to provide an arrangement which will overcome the disadvantages referred to.

Broadly stated, the present invention consists as to one feature in forming the gripper mechanism as a unit which is detachably mounted in position so that it can be removed to expose the straining mechanism and then replaced without the setting of its parts having been disturbed.

It is necessary to provide some form of "slip" connection between the gripper mechanism with the gripper unit and the operating mechanism for the various grippers of the unit: the operating mechanism can comprise a shaft mounted for oscillation in the cylinder and having a series of arms one for each of the gripper fingers of the unit: these arms are provided with tappets to engage the gripper fingers, the engagement providing the slip connections referred to.

It is preferred to bias the gripper fingers individually to their closed or gripping position for such a bias arrangement has been found to provide a smoother action than that given by relying on single bias for all of the grippers.

A further feature of the invention relates to the formation of the part of the cylinder against which the gripper fingers press the sheet when the fingers are in their sheet gripping positions: this surface, hereinafter termed the "seating surface" should be at the level of the under face of the sheet: in practice, to obtain good printing results the blanket is selected as to its thickness to suit the thickness and quality of the paper to be printed. When therefore a seating surface in a fixed position is used, the position can only be a compromise for blankets of different thickness.

According to a further feature of this invention, the seating surface for the gripper fingers is formed on components which are supported by the cylinder for adjustment as to its setting radially of the cylinder: for this way the "height" of the seating surfaces for the gripper fingers can be set to a fine limit to suit the thickness of the blanket to be used in any particular printing operation.

The two features of the invention can be combined and in this case the gripper seating component would be mounted on the removable gripper unit.

A construction embodying the two features is shown in the accompanying drawings, FIGURE 1 of which is a transverse cross section showing the gripper unit in position in chain dotted lines and removed in full lines and FIGURE 2 of which is a side elevation to a smaller scale of the cylinder in the region of its end.

Referring to the drawings, an impression cylinder is indicated at 1, this cylinder having recesses 2, 3 accommodating any usual form of blanket straining mechanism for tensioning the blanket about the surface of the cylinder 1: in the particular arrangement shown, this mechanism comprises two bars 4, 5 to which the ends of the blanket, indicated at B, are secured, the two bars being turned to strain the blanket and being held in position as by a pawl and ratchet device indicated at 5e for the bar 5.

The recess 2 is enlarged at 6 to receive a sheet gripper mechanism unit comprising a series of fingers 7 mounted to turn on a spindle 8. The spindle is secured in a frame or support 9 which is clamped by bolts 10 to a seating base 11 presented by the recess 2, the frame 9 having slots 12 to enable the frame to be slotted into position under the heads of the bolts 10 by which the gripper mechanism unit is normally but detachably fixed to the cylinder 1. Both the blanket straining bar 4 and the sheet gripper mechanism unit are housed within the recess 2, 6 which extends inwardly from the periphery of the cylinder 1 towards the cylinder axis.

The fingers 7 cooperate with a seating surface 13 formed on the frame 9 and the fingers are individually biased by springs 14 to their closed position, i.e., against the seating surface 13, the springs acting against brackets 14a secured to the fixed spindle 8.

The fingers have extensions 15 fitted with followers 16 having slip connection engagement with the heads of individually adjustable tappets 17 on arms 18 on an operating spindle 19 mounted to oscillate in bearings in the recess 6 in the cylinder. This spindle 19 is arranged to be oscillated in any usual way as the cylinder rotates: in the arrangement shown, the spindle 19 is provided with an arm 19a carrying a roller 19b engaging an operating cam track (not shown) which operates to rock the spindle against the action of return springs 19c acting on the arms 18. In this oscillation, the tappets 17 contact the grippers to open them against the action of the various springs 14 (at which time a sheet is presented to the grippers) and then allow the fingers to be closed by the action of their springs (at which time the sheets are gripped between the fingers 7 and the seating 13).

By releasing the various securing bolts 10, the frame 9 which carries the gripper assembly described can be removed as a unit as is indicated in FIGURE 1, the followers 16 parting from, i.e., slipping from under the tappets 17. The blanket tensioning bar 4 is now fully exposed to enable access to be gained easily to it, for a blanket renewing operation: at the end of that operation the gripper assembly unit is replaced and its parts will
have exactly the same setting as they previously had with respect to the operating tappets 17 and the seating 13. As is also shown in the drawing, provision is made to adjust the radial setting of the seating 13; this is effected by disposing under the lower edge of the frame 9 the bevelled ends 20 of slides 21 which can be slid by adjusting studs 22: by slackening the bolts 10 and turning the studs 22, the frame 9 can be adjusted radially within fine limits to enable the setting of the seating 13 to be adjusted to suit any particular blanket thickness; the slides 21 are then locked by clamping bolts 23 in a bar 24 which is secured to the cylinder and is notched at intervals to receive the various slides 21.

We claim:

1. In a rotary sheet printing machine, an impression cylinder formed with a recess extending inwardly from the periphery of the cylinder toward the axis thereof; means mounted on said cylinder within said recess for strains an impression blanket about the cylinder periphery; a sheet gripper mechanism unit comprising a support, a seating on said support and gripper finger means mounted on said support for movement into and out of sheet-gripping position relative to said seating; releasable securing means within said recess detachably fixing said support to said cylinder for mounting said sheet gripper mechanism unit within said recess adjacent said blanket straining means and for movement together with said cylinder without movement of said unit support relative to said cylinder, releasing of said securing means enabling complete removal of said sheet gripper mechanism unit, thereby to render said blanker straining means accessible from outside said cylinder; and means for operating said gripper finger means during rotation of said cylinder comprising a shaft mounted on said cylinder and extending in said recess, and normally engaged slip means operatively connecting said shaft to said gripper finger means and including cooperating parts separable from each other upon releasing of said securing means and removal of said sheet gripper mechanism unit from said recess.

2. In a rotary sheet printing machine, an impression cylinder formed with a recess extending inwardly from the periphery of the cylinder towards the axis thereof; means mounted on said cylinder within said recess for strains an impression blanket about the cylinder periphery; a sheet gripper mechanism unit comprising a support, a seating on said support and gripper finger means mounted on said support for movement into and out of sheet-gripping position relative to said seating; releasable securing means within said recess detachably fixing said support to said cylinder for mounting said sheet gripper mechanism unit within said recess adjacent said blanket straining means and for movement together with said cylinder without movement of said unit support relative to said cylinder, releasing of said securing means enabling complete removal of said sheet gripper mechanism unit, thereby to render said blanker straining means accessible from outside said cylinder; and means for operating said gripper finger means during rotation of said cylinder comprising a shaft mounted on said cylinder and extending in said recess, and normally engaged slip means operatively connecting said shaft to said gripper finger means and including cooperating parts separable from each other upon releasing of said securing means and removal of said sheet gripper mechanism unit from said recess.

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