

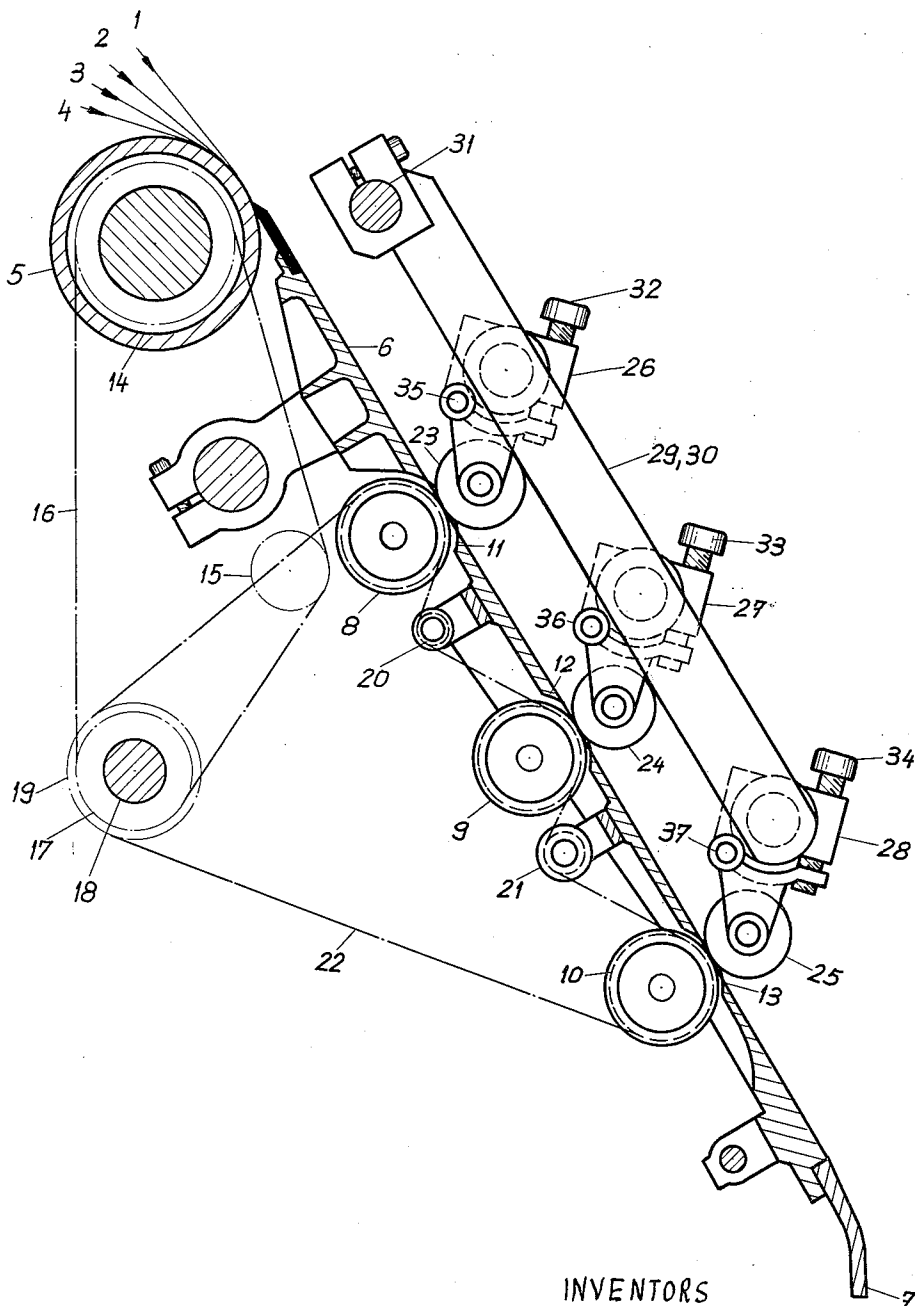
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FORMER FOLDING APPARATUS FOR ROTARY AND LIKE PRINTING MACHINES

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FORMER FOLDING APPARATUS FOR ROTARY AND LIKE PRINTING MACHINES

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The invention relates to improvements in a grooving funnel for use in conjunction with rotary printing machines or other machines provided with grooving devices.

In conventional machines the paper webs to be grooved are conducted over grooving funnels. As long as there are only a few superposed webs to be grooved, no special difficulties generally arise, and the resulting groove is satisfactory. With a great number of webs or layers of paper, however, at least one of the inner webs tends to form folds, which extend from the groove outward to the free edges.

This phenomenon is the result of the thickness of the bundle of paper webs which can no longer be disregarded. As long as only a few paper webs run over the funnel, there is generally little need to provide and adjust a tensioning device under the funnel, and the paper webs need not be pressed too firmly on the funnel. With increasing number of webs, however, they must be gripped more firmly, so that the groove does not go astray. The webs are thus tensioned and the bottom web bearing on the funnel in conventional devices is braked, because of the friction on the funnel surface and the sides of the funnel, and lags slightly behind the upper webs, forming a bag between the funnel feed roll and the funnel. This bag does not stand still, but slides down more or less periodically over the funnel and is squeezed by the tensioning device to form folds.

The present invention eliminates these disadvantages and employs a simple tensioning mechanism for the grooving device. It is characterized in that the grooving cylinder is provided with at least one driven tension cylinder supported transverse to the direction of motion of the paper webs, and that at least one adjustable pressure roller is arranged above the paper webs.

The primary object of the present invention resides in the provision of tensioning means for a grooving device which facilitates the grooving of a very substantial number of paper webs while eliminating the tendency of the inner paper webs to form folds.

Another object of the invention resides in the provision of a grooving device for simultaneously grooving of a greater number of paper webs than heretofore possible.

An additional object of the present invention resides in the provision of means permitting the adjustment of pressure rollers with respect to the tensioning cylinders of a grooving device, so that any desired number of paper webs may be conveniently grooved.

Yet another object of the present invention resides in the provision of means allowing the adjustment of pressure rollers forming important elements of the invention, both simultaneously and individually, as needed.

Thus, together with the various ancillary objects and features of the invention which will become apparent as the foregoing description proceeds, are attained by this grooving device a preferred embodiment being shown in the accompanying drawing, wherein the figure is a vertical sectional view of the grooving device according to the present invention.

Referring now more particularly to the drawing, there is schematically disclosed the manner in which the invention may be realized.

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The paper webs 1, 2, 3, 4, etc. up to any desired very substantial number are fed down the grooving funnel plate 6 over the funnel roll 5 for delivery to a subsequent tension device (not illustrated) underneath the grooving funnel nose 7. The grooving funnel extends slopingly at an angle in the order of about 50 degrees to 75 degrees to the horizontal.

On the rear side of the grooving funnel 6 are transversely and adjustably mounted, for example, three tension cylinders or drums 8, 9, 10, three recesses 11, 12, 13 being provided in the grooving funnel so that the exterior surfaces of the tension cylinders are aligned with the surface of the grooving funnel. The plate 6 is contoured so that the recesses substantially conform to the tension cylinders 8, 9 and 10.

The tension cylinders 8, 9, 10 can be adjusted so as to be slightly projecting with respect to the surface of the grooving funnel by adjusting means, not shown.

The drive of the tension cylinders is effected, for example, by the funnel roll 5 over the V-belt pulley 14, idler 15, V-belt 16, to the V-belt pulley 17 driving the shaft 18 and transmitting the rotary motion to the tension cylinders 8, 9, 10 over the V-belt pulley 19, idlers 20, 21 by means of the V-belts 22. The V-belts arranged as set forth provide a timed operation for the device. Instead of the V-belts, it is also possible to use chains or other means for the drive.

Above the paper webs 1, 2, 3, 4 etc. there are arranged pressure rollers 23, 24, 25 in the range of and adjacent the respective tension cylinders, swingably mounted in two-part holders 26, 27, 28 which are secured in the supports 29 and 30. The supports 29 and 30 are adjustably locked on the shaft 31. The pressure rollers 23, 24, 25 can be adjusted individually by the adjusting screws 32, 33, 34 so that the pressure rollers can be turned about the pins 35, 36, 37. The common simultaneous swivelling of the pressure rollers is achieved by turning the lockable supports 29 and 30 on the shaft 31.

In operation, the paper webs 1, 2, 3, 4, etc. are fed over the funnel roll 5 and then on the inclined surface of the grooving funnel plate 6, so as to pass between the respective tension cylinders 8, 9 and 10 and pressure rollers 23, 24 and 25. The tension cylinders 8, 9 and 10 are preferably driven by the V-belted drive in timed relation to the funnel roll 5 with the surface speed of the tension cylinder being at least equal to the surface speed of the funnel roll, whereby, in conjunction with the suitable pressure supplied on the web by the pressure rollers 23, 24 and 25, there will be no tendency to form folds or bags in any of the paper webs.

Thus it can be seen that there has been provided a grooving funnel for rotary printing machines and like apparatus which includes a grooving funnel 6, a funnel roll 5 for feeding paper webs 1, 2, 3, 4, etc. onto the plate 6, the plate 6 having a plurality of recesses 11, 12, 13 configured to conform to the shape of tension cylinders 8, 9, and 10 which extend into the recesses with the exterior surfaces of the tension rollers lying substantially flush with the plate 6.

There are further provided a plurality of pressure rollers 23, 24, 25 and mounting means including the supports 29, 30 and holders 26, 27, 28 for arranging respectively the simultaneous swivelling of all of the pressure rollers and the individual adjustment of the pressure rollers.

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A grooving funnel for rotary printing machines and

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like apparatus comprising a grooving funnel plate, a funnel roll adjacent said plate for feeding paper webs onto said plate, said plate having a plurality of recesses therein, tension cylinders extending into said recesses with the exterior surfaces of said tension cylinders lying substantially flush with said plate, a plurality of pressure rollers, mounting means for said rollers supporting said rollers adjacent and in alignment with said tension cylinders so that folds will be prevented from forming in paper webs passing between said tension cylinders and said pressure rollers, said mounting means including a support for said pressure rollers, a shaft for said support, means rotatably adjustably securing said support on said shaft so that upon rotation of said support all of said pressure rollers will be adjusted simultaneously relative to said plate and said tension cylinders, said mounting means further including a two-part holder pivoted to said support for each of said pressure rollers, and adjusting screw means provided for each holder for individually adjust-

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ing each of said holders and the respective pressure roller relative to said plate.

2. A grooving funnel according to claim 1, wherein said tension cylinders are supported adjustably towards said plate and the paper webs.

3. A grooving funnel according to claim 1, wherein said plate extends at an angle ranging between 50 and 75 degrees with respect to the horizontal.

4. A grooving funnel according to claim 1, wherein said plate is configured so that said recesses conform to the shape of said tension cylinders.

5. A grooving funnel according to claim 1, including timed drive means for said funnel roll and said tension cylinders.

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