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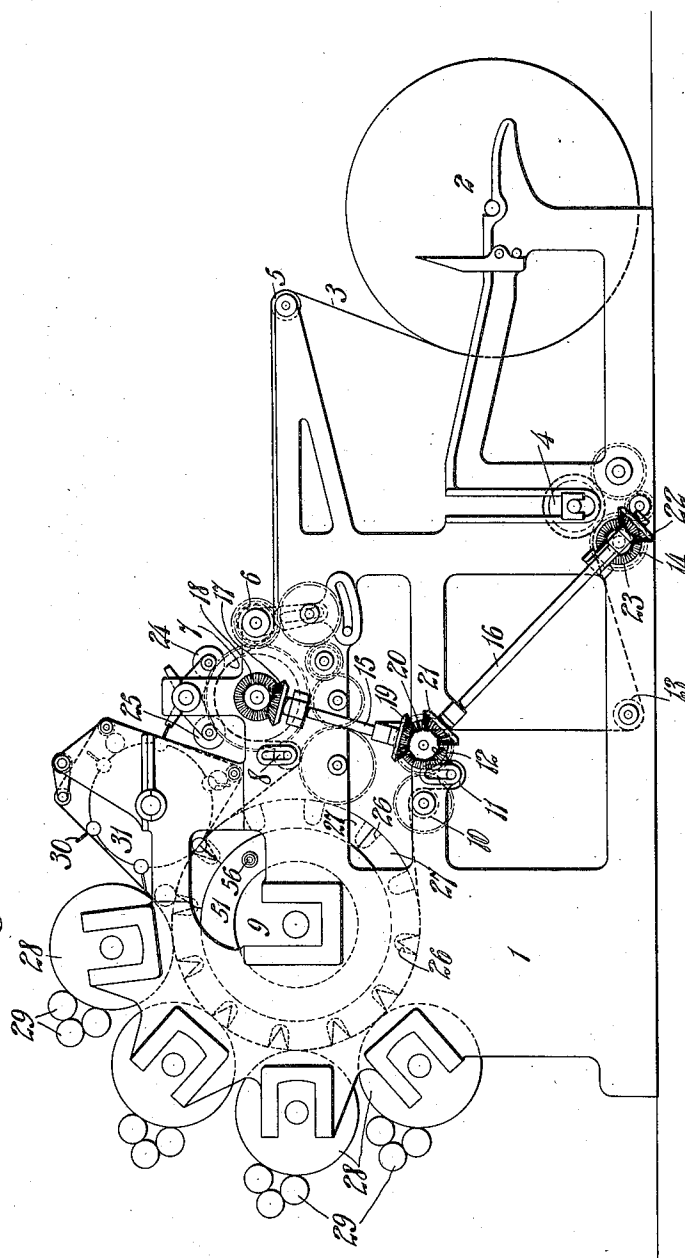
H. M. BARBER

ROTARY WEB PRINTING PRESS

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2 Sheets-Sheet 1

Fig. 1.



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UNITED STATES PATENT OFFICE.

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ROTARY WEB-PRINTING PRESS.

Application filed January 17, 1924. Serial No. 686,795.

To all whom it may concern:

Be it known that I, HOWARD M. BARBER, a citizen of the United States, and resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Rotary Web-Printing Presses, of which the following is a specification.

My invention relates to novel means in a rotary web printing press for taking up, within certain limits, a varying amount of material in a web between the portions thereof which are to be printed so as to space such printed matter varying distances apart, according to the length of sheet to be cut from the web, the printed matter on every sheet being thereby located in the same position; suction means being employed for holding the impression portions of the web snugly on their impression surfaces during the printing operation.

My invention more particularly includes two rotary carriers, the carrier which serves as the impression cylinder having an annular series of impression surfaces spaced apart by an annular series of recesses, and the other carrier bearing an annular series of spaced floating tucking blades arranged to tuck a predetermined amount of the web material into their respective recesses in the impression cylinder, the tucking blades being radially adjustable with respect to their carrier to take up varying amounts of the web material between the portions to be printed, suction means being employed along the opposite sides of the impression surfaces adjacent the recesses to hold the impression portions of the web snugly against the impression surfaces of the cylinder during the printing operation.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Fig. 1 represents diagrammatically in side elevation, a multi-color rotary web printing press with my improvements applied thereto, the web being shown threaded through the press.

Fig. 2 represents a detail vertical cross section through the press on an enlarged scale.

Fig. 3 represents a detail section taken in the plane of the line III—III of Fig. 2.

Fig. 4 represents a detail section taken in the plane of the line IV—IV of Fig. 2,

showing an inner face view of the stationary suction ring which coacts with the rotary impression cylinder.

Fig. 5 represents an end view of one of the impression segments.

Fig. 6 represents a side view, partly in section, of the same.

Fig. 7 represents a view of one of the end supporting brackets for the radially adjustable web tucking blades.

Fig. 8 represents a face view of one of the tucking blades.

Fig. 9 represents an end view of the same.

The frame of the multi-color rotary web printing press is denoted by 1. The web is led from the supply roll 2 to the rewinding roll 4 successively around the rolls 5 and 6, the feed drum 7, the slack take-up roller 8, the impression cylinder 9, the roll 10, the slack take-up roller 11 and the rolls 12, 13 and 14 of the rewinding mechanism. The rolls of the rewinding mechanism are driven at a surface speed slightly in excess of that of the rolls of the web feeding mechanism so that the web is always wound under proper tension to give a perfectly re-wound roll. The drive for the two mechanisms, in the present instance, includes the shafts 15 and 16, the shaft 15 having at one end the bevel gear connection 17, 18, with the web feed drum 7, and at the other end the bevel gear connection 19, 20, 21 with the corresponding end of the shaft 16. The other end of this shaft 16 has the bevel gear connection 22, 23, with the rewinding roll 14. Suitable web feed rolls 24, 25 are provided for coaction with the web feed drum 7 to ensure the accurate feeding of the web to the impression cylinder 9.

This impression cylinder 9 is provided with an annular series of lengthwise recesses 26, equally spaced apart around the peripheral surface of the cylinder, forming a plurality of impression segments 27, arranged to coact with one or more form cylinders 28 to print the desired matter on the web during its passage through the press. In the present instance I have shown four of these form cylinders 28, their inking devices being indicated diagrammatically by 29 so that a multi-color impression may be made at spaced intervals along the web.

An annular series of floating tucking blades 30 are carried by the rotary cylinder 31, which blades are arranged to be brought

into and out of coaction with their respective recesses 26 in the impression cylinder 9. These tucking blades 30 are arranged equal distances apart around the periphery of the rotary cylinder 31 and are constructed, mounted and operated as follows:—

Two end hangers 33, 33 for each blade are provided with trunnions 34, 34, pivotally mounted in brackets 35, 35, secured to the opposite ends of the cylinder 31, which hangers are connected by a bar 36 to which the tucking blade 30 is adjustably secured by providing the blade with a plurality of transversely elongated slots 37, through which set screws 38 pass into the bar 36. The tucking blades are thus mounted to swing on the trunnions 34, 34 and are radially adjustable on the bar 36 with respect to their cylinder 31.

At one end of the cylinder 31 the trunnion 34 is provided with an arm 39 bearing a stud or roller 40, arranged to travel in the groove of a cam 41, rotatively adjustable on the main frame by providing the cam with ears 42 having circumferentially elongated slots 43, through which pass the set screws 44.

The impression segments 27 of the impression cylinder 9 are removably secured to the cylinder by screws 45, said segments being faced with suitable pliable material 46 to ensure a good printing impression. The removability of the segments permits their replacements from time to time, as required, due to wear, defects or injury, without requiring the replacement of the entire cylinder surfaces.

The suction means which I have shown for holding the impression portions of the web snugly on their impression surfaces during the printing operation is constructed, arranged and operated as follows:—

The interior of the impression cylinder 9 is divided by radial partitions 47, into an annular series of suction chambers 48, corresponding in number to the number of impression segments 27. Air ducts 49 lead from the impression face of each segment to their respective suction chambers 48, said ducts being arranged in series along both sides of each of the impression segments adjacent to the recesses 26. The annular series of suction chambers 48 in the impression cylinder 9 have an annular series of concentric ports 50 at one end of the cylinder opposite the inner face of a stationary suction ring 51, which ring has an annular open faced recess divided by radial partitions 52, 53 into a segmental suction chamber 54 and a segmental release chamber 55, the suction chamber 54 being in communication with a vacuum means (not shown) through the passage 56, and the release chamber 55 being open to external atmosphere through one or more ports 57. The open inner face of the

stationary ring 51 is held yieldingly against the end of the impression cylinder 9 by springs 58 located between the main frame and said ring.

An endless tape carrier is provided for leading the web between the cylinders 9 and 31 and along the cylinder 9 until the web has been taken in control on the successive impression surface of the cylinder by the suction means. The tapes 59 surround the cylinder 31 and pass around the rolls 60, 61, 62, 63. The tucking blades 30 are provided with slots 64, along their edges through which the tapes 59 pass.

In operation:

The web tucking blades 30 on the cylinder 31 are adjusted radially to provide for forcing a greater or lesser amount of the web material into the recesses 26 between the impression surfaces 27 on the cylinder 9.

The web, as it enters the press, is fed at a predetermined speed by the feeding drum 7 and its coacting feed rolls 24, 25. The web passes around the take-up roll 8 and from thence to the impression cylinder 9 where the desired amount of material is forced inwardly by each tucking blade into its corresponding recess, said blade being floated into its proper position. As this tucking operation is completed the suction means comes into operation for holding the impression portion of the web snugly against the impression surface 27 and the impression portion of the web is so held while the web is carried by the impression cylinder under the printing forms to receive the impressions thereon. After the printing operation is completed the suction means is released and the web is rewound on the roll 4, the web passing around the take-up roll 11 in its progress from the impression cylinder to the said roll. The web rewinding mechanism may be driven at a surface speed slightly in excess of that of the web feeding mechanism so as to impart proper tension to the web as it is being rewound.

It will be understood that when the ports 50 of the suction chambers 48 in the cylinder 9 are opposite the suction chamber 54, the web will be held snugly to the cylinder and when these ports are opposite the release chamber 55 the suction effect on the web is thereby released, to permit the web to be readily drawn from the impression cylinder to the rewinding mechanism.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention; hence, I do not wish to be limited to the particular embodiment herein shown and described, but

What I claim is:—

1. In a rotary web printing press, an impression cylinder, means for forcing a prede-

terminated amount of web material into the cylinder, and suction means for holding the impression portions of the web snugly on said cylinder during the printing operation.

2. In a rotary web printing press, an impression cylinder, an endless series of web tucking blades for forcing a predetermined amount of the web material into said cylinder, and suction means for holding the impression portions of the web snugly on said cylinder during the printing operation.

3. In a rotary web printing press, an impression cylinder having an annular series of spaced impression surfaces, means for forcing a predetermined amount of web material into the cylinder between said impression surfaces, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

4. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, means for forcing a predetermined amount of the web material into said recesses, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

5. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, an endless series of web tucking blades for forcing a predetermined amount of the web material into said recesses, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

6. In a rotary web printing press, an impression cylinder, a tucking blade cylinder having an annular series of spaced blades for forcing a predetermined amount of the web material into said cylinder, and suction means for holding the impression portions of the web snugly on said cylinder during the printing operation.

7. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, a tucking cylinder having an annular series of spaced blades for forcing a predetermined amount of the web material into said recesses, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

8. In a rotary web printing press, an impression cylinder, a tucking blade cylinder having an annular series of spaced blades for forcing a predetermined amount of the web material into said cylinder, means for floating the tucking blades, and suction means for holding the impression portions of the web snugly on said cylinder during the printing operation.

9. In a rotary web printing press, an im-

pression cylinder having annular series of spaced impression surfaces and recesses, a tucking blade cylinder having an annular series of spaced blades for forcing a predetermined amount of the web material into said recesses, means for floating the tucking blades, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

10. In a rotary web printing press, an impression cylinder, a tucking blade cylinder having an annular series of spaced radially adjustable tucking blades for forcing a greater or lesser amount of the web material into said cylinder, and suction means for holding the impression portions of the web snugly on said cylinder during the printing operation.

11. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, a tucking blade cylinder having an annular series of spaced radially adjustable tucking blades for forcing a greater or lesser amount of the web material into said recesses, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

12. In a rotary web printing press, an impression cylinder, a tucking blade cylinder having an annular series of spaced radially adjustable tucking blades for forcing a greater or lesser amount of the web material into said cylinder, means for floating the tucking blades, and suction means for holding the impression portions of the web snugly on said cylinder during the printing operation.

13. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, a tucking blade cylinder having an annular series of spaced radially adjustable tucking blades for forcing a greater or lesser amount of the web material into said recesses, means for floating the tucking blades, and suction means for holding the impression portions of the web snugly on said impression surfaces during the printing operation.

14. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, means for forcing a predetermined amount of the web material into said recesses, said cylinder having an annular series of chambers communicating with the impression surfaces, and means for successively opening said chambers to a suction passage for holding the impression surfaces during the printing operation, and to external atmosphere to release the suction effect for permitting the printed web to be drawn from the cylinder.

15. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, means for forcing a predetermined amount of the web material into said recesses, said cylinder having an annular series of chambers communicating with the impression surfaces through air ducts extending along the sides of the impression surfaces adjacent the recesses, and means for successively opening said chambers to a suction passage for holding the impression surfaces during the printing operation and to external atmosphere to release the suction effect for permitting the printed web to be drawn off from the cylinder.

16. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, means for forcing a predetermined amount of the web material into said recesses, said cylinder having an annular series of chambers communicating with the impression surfaces, and means for successively opening said chambers to a suction passage for holding the impression portions of the web snugly on their impression surfaces during the printing operation and to external atmosphere

to release the suction effect for permitting the printed web to be drawn off from the cylinder, said last named means including a stationary annular member having segmental suction and release chambers.

17. In a rotary web printing press, an impression cylinder having annular series of spaced impression surfaces and recesses, means for forcing a predetermined amount of the web material into said recesses, said cylinder having an annular series of chambers communicating with the impression surfaces through air ducts extending along the sides of the impression surfaces adjacent the recesses, and means for successively opening said chambers to a suction passage for holding the impression surfaces during the printing operation and to external atmosphere to release the suction effect for permitting the printed web to be drawn off from the cylinder, said last named means including a stationary annular member having segmental suction and release chambers.

In testimony that I claim the foregoing as my invention I have signed my name this fourteenth day of January, A. D. 1924.

HOWARD M. BARBER.