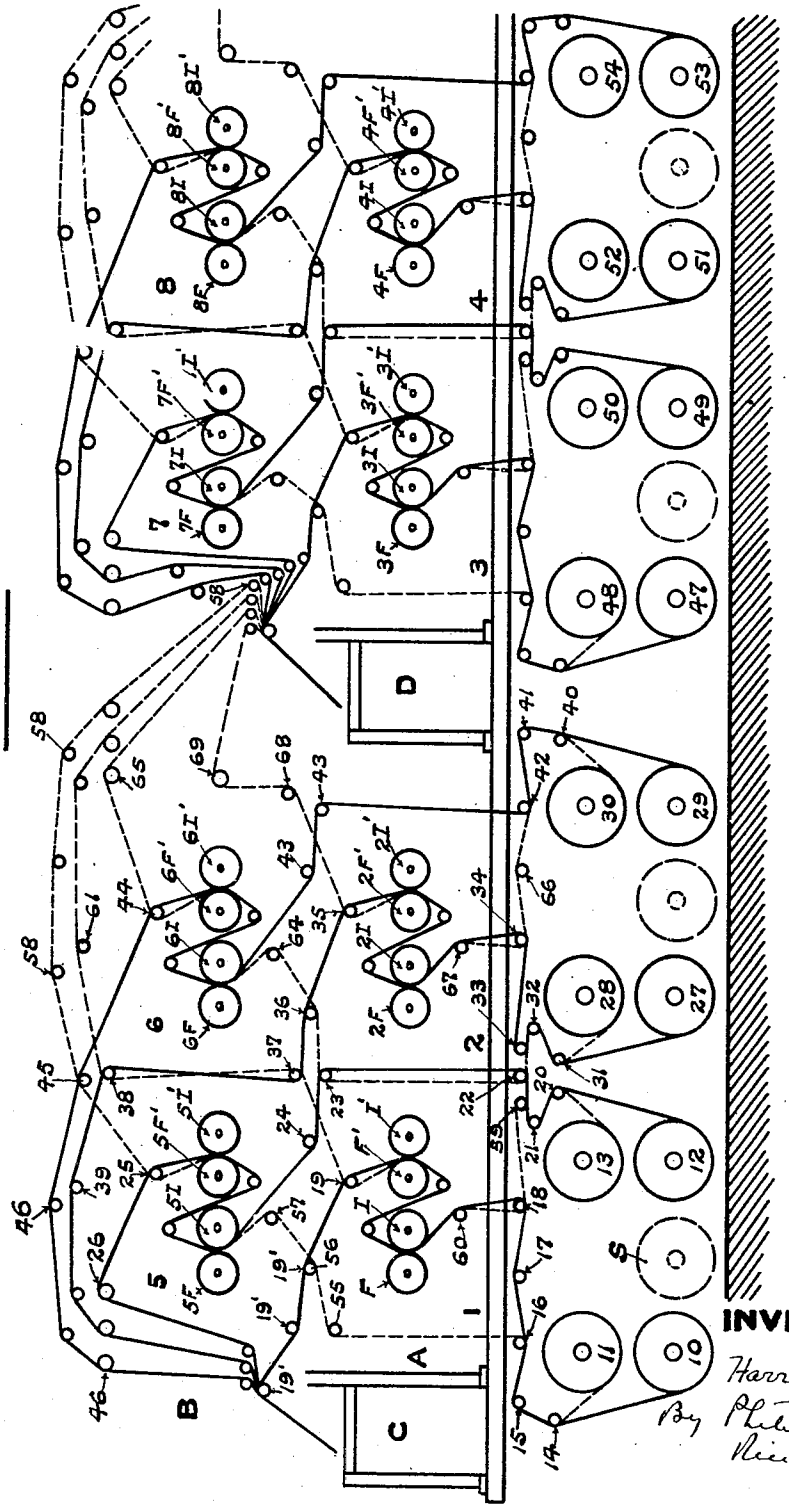
Dec. 24, 1929. H. V. BALL 1,741,122

MULTIUNIT PRINTING MACHINE

Filed Dec. 10, 1927 2 Sheets-Sheet 1



— FIG. 1. —

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MULTIUNIT PRINTING MACHINE

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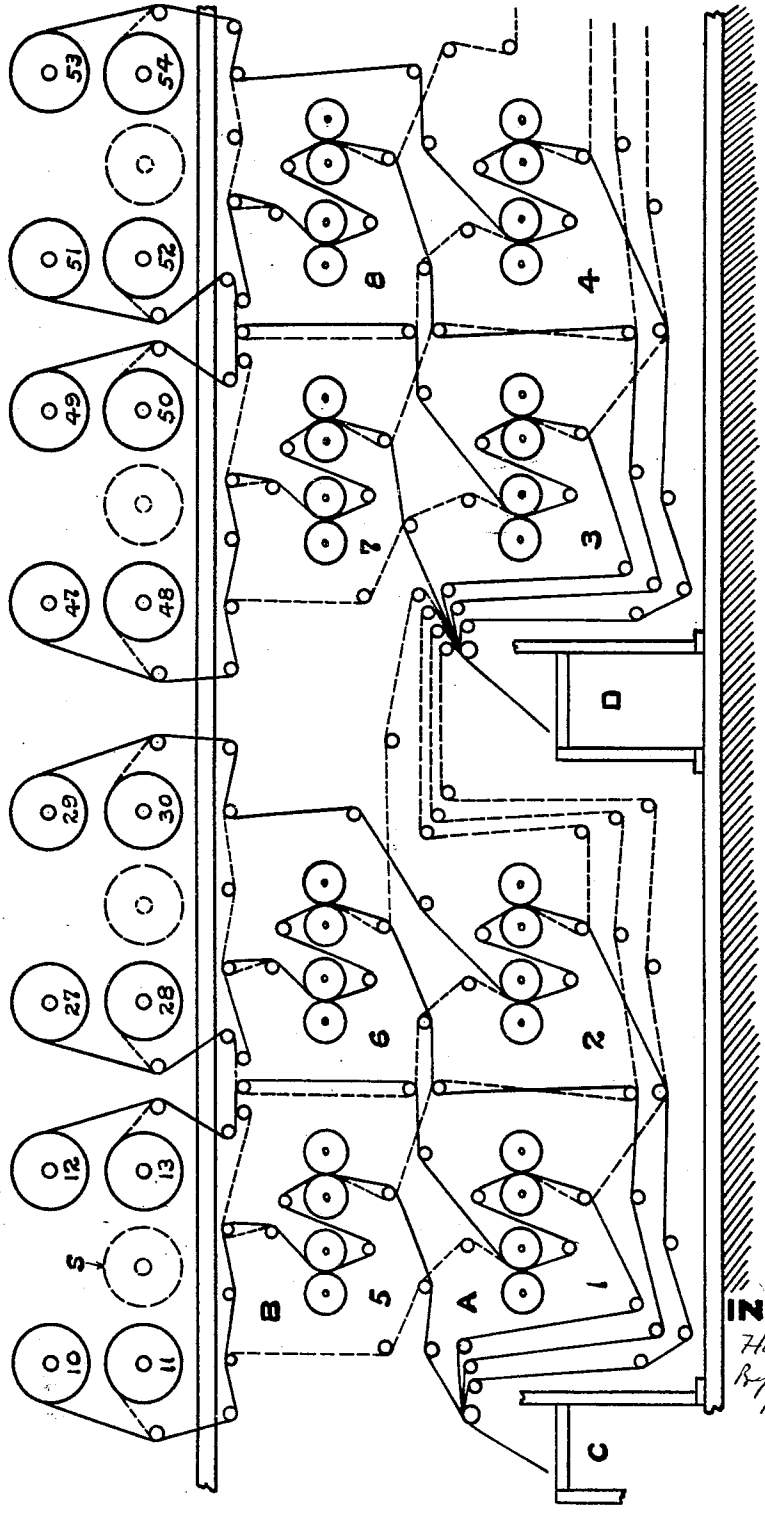


FIG. 2.

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Patented Dec. 24, 1929

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UNITED STATES PATENT OFFICE

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MULTIUNIT PRINTING MACHINE

Application filed December 10, 1927. Serial No. 239,083.

This invention relates to certain improvements in multi-unit printing machines in which the printing units are arranged in superposed decks, and the invention particularly relates to an improved arrangement of the web rolls for supplying printing units so arranged.

Certain types of multi-unit printing machines include a press comprising a plurality of printing units arranged in line, these units being associated in groups with suitable folders arranged in certain desired relations with respect to the groups. Where such machines comprise a large number of units, the webs cannot be conveniently fed from the ends of the press and they are therefore fed from above or below the units. In these large machines, a number of web rolls must be used during a run of the press, and the run from the web rolls to the printing units should be as short as possible. The space which can accommodate the requisite running and spare rolls is by reason of the press construction of small area and this space cannot well be enlarged. Where it may be desired to produce a press including a second deck of units, special supports must be provided for the web rolls for the units of the second deck.

It is the special object of the present invention to provide an arrangement for the web rolls of a multi-unit multi-deck machine so that the running rolls and the spare rolls for two decks of units may be arranged in the same space ordinarily occupied by the web rolls for a single deck machine.

A further object of the invention is to provide such a press arrangement in which the webs may be run to the respective units from the web rolls, and after printing run to any folder as desired without interference between the running webs.

With these and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the claims hereunto annexed.

In these drawings,—

Figure 1 is a diagrammatic arrangement of a multi-unit multi-deck machine embodying the improved web roll arrangement for supplying the units, the web feed being shown as from below the press, and

Figure 2 is a similar view showing an arrangement which may be adopted with the web rolls arranged above the press.

Referring now to these drawings, the machine chosen to illustrates the invention includes a press in which eight printing units are shown arranged in two superposed decks with a folder arranged at the end of the press and a folder arranged between the groups of units, but it will be understood that the press may be extended to include any desired number of units and folders grouped as may be desired. The invention is therefore not to be restricted to the particular number of units or unit arrangement shown.

In the machine illustrated, however, there is provided a press A which includes four units 1, 2, 3, 4, arranged in line on one level and preferably with their cylinders in parallel alignment. Each of these units is identical and includes a printing and perfecting couple. The press 1 comprises a printing couple including a form cylinder F and an impression cylinder I, and a second printing couple including a form cylinder F′ and an impression cylinder I′. Press 2 comprises a printing couple including a form cylinder 2^F and an impression cylinder 2^I, and a second printing couple including a form cylinder $2^{F'}$ and an impression cylinder $2^{I'}$. Press 3 comprises a printing couple including a form cylinder 3^F and an impression cylinder 3^I, and a second printing couple including a form cylinder $3^{F'}$ and an impression cylinder $3^{I'}$. Similarly, press 4 comprises a printing couple including a form cylinder 4^F and an impression cylinder 4^I, and a second printing couple including a form cylinder $4^{F'}$ and an impression cylinder $4^{I'}$.

Superposed above this press A is a press of a similar number of units arranged in a similar manner, this press being marked B and including four units 5, 6, 7, 8, each of which includes a printing and perfecting couple, the cylinders of which are prefer-

ably arranged substantially in line. Thus press 5 includes a printing couple having a form cylinder 5^F and an impression cylinder 5^I, and a second printing couple including a form cylinder $5^{F'}$ and an impression cylinder $5^{I'}$. Press 6 comprises a printing couple having a form cylinder 6^F and an impression cylinder 6^I, and a second printing couple including a form cylinder $6^{F'}$ and an impression cylinder $6^{I'}$. Press 7 comprises a printing couple having a form cylinder 7^F and impression cylinder 7^I, and a second printing couple including a form cylinder $7^{F'}$ and an impression cylinder $7^{I'}$. Similarly, press 8 comprises a printing couple having a form cylinder 8^F and an impression cylinder 8^I, and a second printing couple including a form cylinder $8^{F'}$ and an impression cylinder $8^{I'}$.

In the particular construction shown, there is a folder C arranged at the end of the units 1, 5, and a second folder D arranged between the units 2, 6 and the units 3, 7, to which the webs from the units may be led as hereinafter referred to. In accordance with the invention, an improved web roll arrangement is provided for supplying the webs to the multi-deck machine in which the running and spare web rolls may be maintained in a comparatively small space either above or below the units, this space being no larger than has ordinarily been used for the web rolls of a single press, the run from the rolls to the units being direct, and suitable guides are provided for properly guiding the webs so as to avoid web interference. While this arrangement may be somewhat varied, in the particular construction illustrated the web rolls for supplying each unit are supported in superposed relation, that is, the rolls are supported in substantially vertical alignment and the rolls are spaced apart sufficiently to permit the spare rolls to be moved endwise into position, so that they may be placed in either in the upper or the lower roll supports. Referring first to presses 1—5, there are shown a running web roll 10 and a spare web roll 11 mounted in superposed relation, and a second pair of web rolls 12, 13, also mounted in superposed relation. Two of these rolls, as the rolls 10, 12, are shown as the running rolls, with the rolls 11, 13 held in reserve. These superposed sets of web rolls are spaced sufficiently far apart to permit of other spare rolls, as the spare roll S, to be slid in sidewise so that they can be moved into any of the roll supports for roll replenishing.

These rolls may be led to the units in any suitable manner. As for instance, referring to the full line construction shown, the web from the roll 10 passes over a guide roll 14, arranged at one side of the vertical axes of the two web rolls so that it will clear the upper roll 11. This web 10 then passes over a guide roll 15 under a guide roll 16 over a guide roll 17 around a guide roll 18 to the press 1 and, after printing, passes around suitable guide rolls 19, 19′ to folder C. The web from the roll 12, or the roll 13, passes over a guide roll 20 arranged similarly to the guide roll 14, that is, to one side of the vertical axes of the rolls 12, 13 over a guide roll 21 under a guide roll 22 and around guide rolls 23, 24 to press 5, and after printing passes around guide rolls 25, 26 to the folder C, being there associated with the web 10 from press 1. When now the rolls 10, 12 have been exhausted, the rolls 11, 13 may be used, the run of the webs being the same.

Similarly, units 2, 6 are fed from web rolls 27, 28, 29, 30, these rolls being located below the units 2, 6 and arranged similarly to the web rolls for units 1, 5. Still referring to the full line leads shown, the web from the roll 27 passes over a guide roll 31 arranged at one side of the vertical axes of the rolls 27, 28 around a guide roll 32 over a guide roll 33 around a guide roll 34 to unit 2 and, after leaving unit 2, over guide rolls 35, 36 under a guide roll 37 and over guide rolls 38, 39 to folder C. The web from roll 29 runs around a guide roll 40, arranged similarly to the guide roll 31, this roll, of course, being on the opposite side of the rolls 29, 30. From the guide roll 40 the web runs over a roll 41 under a roll 42 and around guide rolls 43 to the press 6 and, after leaving the press, passes over a guide roll 44 and over guide rolls 45, 46 to folder C.

The web leads from units 3, 7 are supplied from web rolls 47, 48, 49, 50, and the units 4, 8 are supplied from web rolls 51, 52, 53, 54. The web leads from these rolls to the units are the same as those already described with reference to units 1, 2, 5, 6, and the webs from units 3, 4, 7, 8, may go to folder D and there be associated. As these leads and guide rolls are the same as those already described further description is unnecessary.

Under some circumstances, it may be desirable to associate the webs from units 1, 2, 5, 6 at folder D and, where the webs are to be thus run, a slightly different arrangement of the runs from the web rolls to the presses is necessary. Such a run of the webs has been shown in the drawings in dotted lines. Referring first to presses 1, 5, the web from rolls 10, 11 passes under guide roll 16 over a guide roll 55 under a guide roll 56 and around a guide roll 57 to press 5. After leaving press 5, the web goes over guide rolls 25, 45, before referred to, and over guide rolls 58 to the folder D, there being associated with other webs.

The web from web rolls 12, 13 passes around the guide roll 21, then around a guide roll 59 under guide roll 18, before referred to, around a guide roll 60 to press 1 and, after leaving the press, passes around the guide

roll 19 under guide roll 37 over guide roll 38, before referred to, and then over guide rolls 61 to folder D.

The web from web rolls 27, 28 passes over guide roll 31 around guide roll 32 under guide roll 22 over roll 23 under guide roll 36 around a guide roll 64 to press 6 and, after leaving press 6, over guide roll 44 and over a guide roll 65 to the folder.

The web from web rolls 29, 30 passes over guide rolls 40, 41 under guide roll 42 over a guide roll 66 around beneath guide roll 34 over a guide roll 67 to press 2 and, after leaving press 2, goes over guide roll 35 under a guide roll 68 over guide rolls 69 to folder D.

Thus all the webs may, as shown, be associated, if desired, at folder D. Similarly, the webs from presses 3, 4, 7, 8, instead of going to folder D, may go to a folder at the right of the drawing in Figure 1, not shown. The lead of the webs being, as shown, in dotted lines and similar to that already described with reference to the dotted line runs in presses 1, 2, 5, 6.

It will be understood that if desired the web may be run from rolls arranged above the press, as shown in Figure 2. The web leads and guide rolls are, however, the same as those already described for the under feed and a detailed description of the same is, therefore, unnecessary.

With the arrangement described, it will be seen that a double deck multi-unit machine may be fed from a web supply from either above or below, this web supply taking up but a small space so that additional arrangements for supplying the webs to the upper decks are unnecessary.

While the invention has been shown and described in its preferred form and arrangement, it will be understood that certain variations in the web leads and in the arrangement of the various guide rolls may be made without departing from the invention as defined in the appended claims.

What I claim is:

1. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls for each unit located in a space substantially coextensive with the width of the units, and web guides for leading the webs from the running web rolls around the inactive web rolls to the respective units.

2. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls arranged in sets which are spaced apart to permit a spare roll to pass between them and located in a space substantially coextensive with the width of the units, and web guides for leading the webs from the running web rolls around the inactive web rolls to the respective units.

3. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls for each unit located in a space substantially coextensive with the width of the units, web guides for leading the webs from the lower web rolls around the upper web rolls, and web guides for leading a web to the units in different paths.

4. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls arranged in sets which are spaced apart to permit a spare roll to pass between them and located in a space substantially coextensive with the width of the units, web guides for leading the webs from the lower web rolls around the upper web rolls, and web guides for leading a web to the units in different paths.

5. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls for each unit located in a space substantially the width of the units, and means whereby the webs from the running web rolls may be led around the inactive web rolls to the units without web interference.

6. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls for each unit located in a space substantially the width of the units, means whereby the webs from the running web rolls may be led around the inactive web rolls to the units without web interference, and web guides for leading a web to the units in different paths.

7. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls for each unit located in a space substantially the width of the units, folders, web guides for associating a plurality of webs at any folder, means whereby the webs from the running web rolls may be led around the inactive web rolls to

the units without web interference, and web guides for leading the webs to the units in one path when the webs go to one folder and in another path when the webs go to a different folder.

8. In a multi-unit printing machine, the combination of a plurality of units arranged in line, a plurality of units arranged in line above the first units, a web supply for each set of superposed units comprising superposed running and inactive web rolls for each unit located in a space substantially the width of the units, folders, web guides for associating a plurality of webs at any folder, web guides for leading the running webs around the inactive web rolls without interference, and web guides for leading the webs to the units in one path when the webs go to one folder and in another path when the webs go to a different folder.

9. In a multi-unit printing machine, the combination of a plurality of printing units, a plurality of printing units above the first units, a web supply for each set of superposed units comprising running and inactive web rolls located in a space substantially coextensive with the width of the units and below the same, and web guides for leading the running webs to the units without interference with the inactive web rolls.

10. In a multi-unit printing machine, the combination of a plurality of printing units, a plurality of printing units above the first units, a web supply for each set of superposed units comprising running and inactive web rolls located in a space substantially coextensive with the width of the units, web guides for leading the running webs to the units without interference with the inactive web rolls, and web guides for leading the webs to the units in different paths.

11. In a multi-unit printing machine, the combination of a plurality of printing couples arranged in line, a plurality of printing couples arranged in line above the first printing couples, a web supply for each of the superposed couples comprising superposed running and inactive web rolls located in a space substantially the width of the couples and below the couples, and means whereby the webs from the running web rolls may be led around the inactive web rolls to the couples without web interference.

12. In a multi-unit printing machine, the combination of a plurality of printing couples arranged in line and spaced apart, a plurality of printing couples arranged in line above the first couples and spaced apart, a web supply for each of the superposed printing couples comprising superposed running and inactive web rolls for each couple located in a space substantially the width of the couples and below the same, and means whereby the webs from the running rolls may be led around the inactive web rolls to the couples without web interference.

In testimony whereof, I have hereunto set my hand.

HARRY V. BALL.