

March 17, 1931.

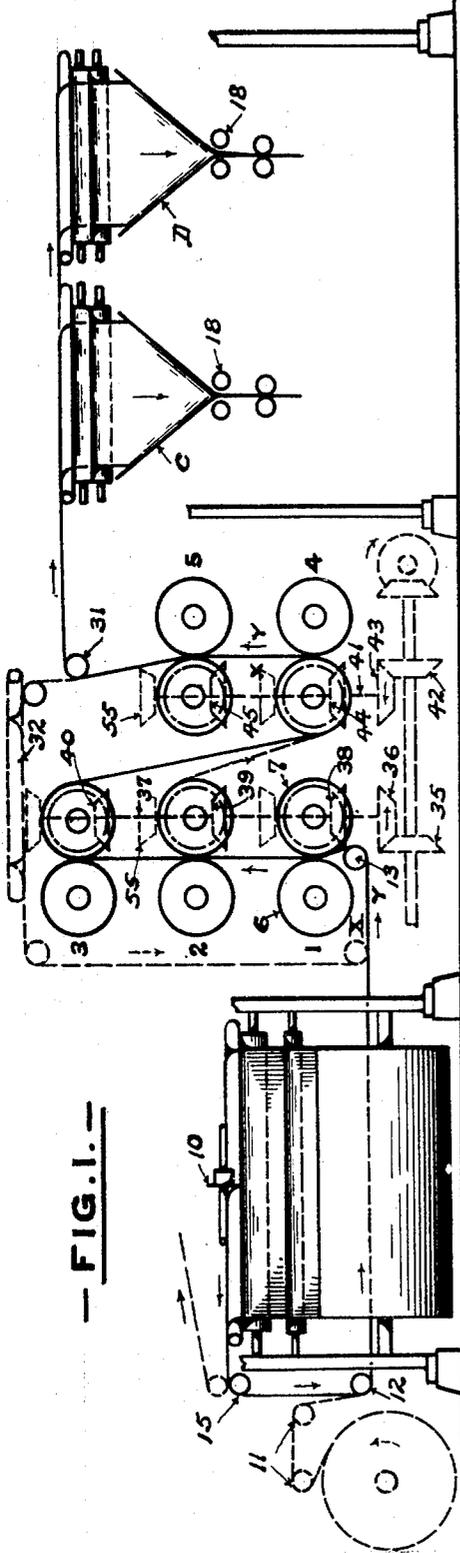
H. V. BALL

1,796,643

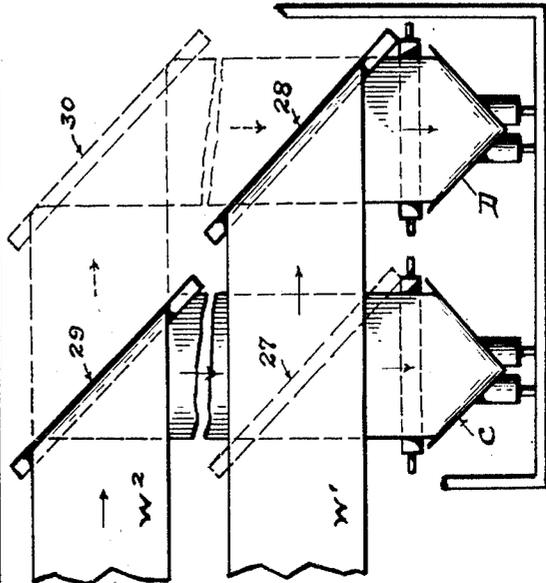
MULTICOLOR PRESS

Filed Nov. 1, 1927

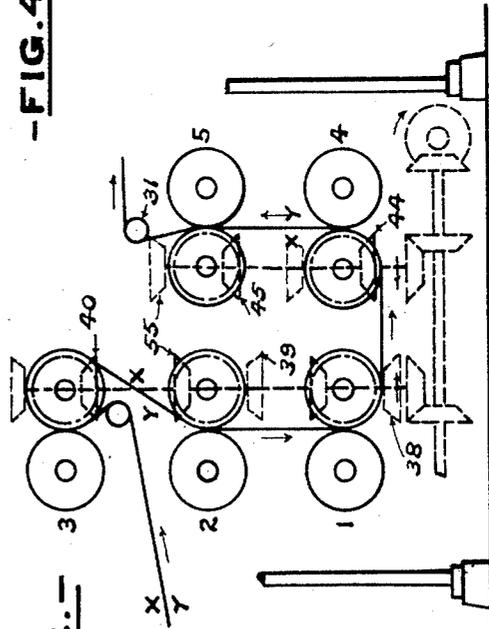
3 Sheets-Sheet. 1



— FIG. 1. —



— FIG. 4. —



— FIG. 2. —

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3 Sheets-Sheet. 2

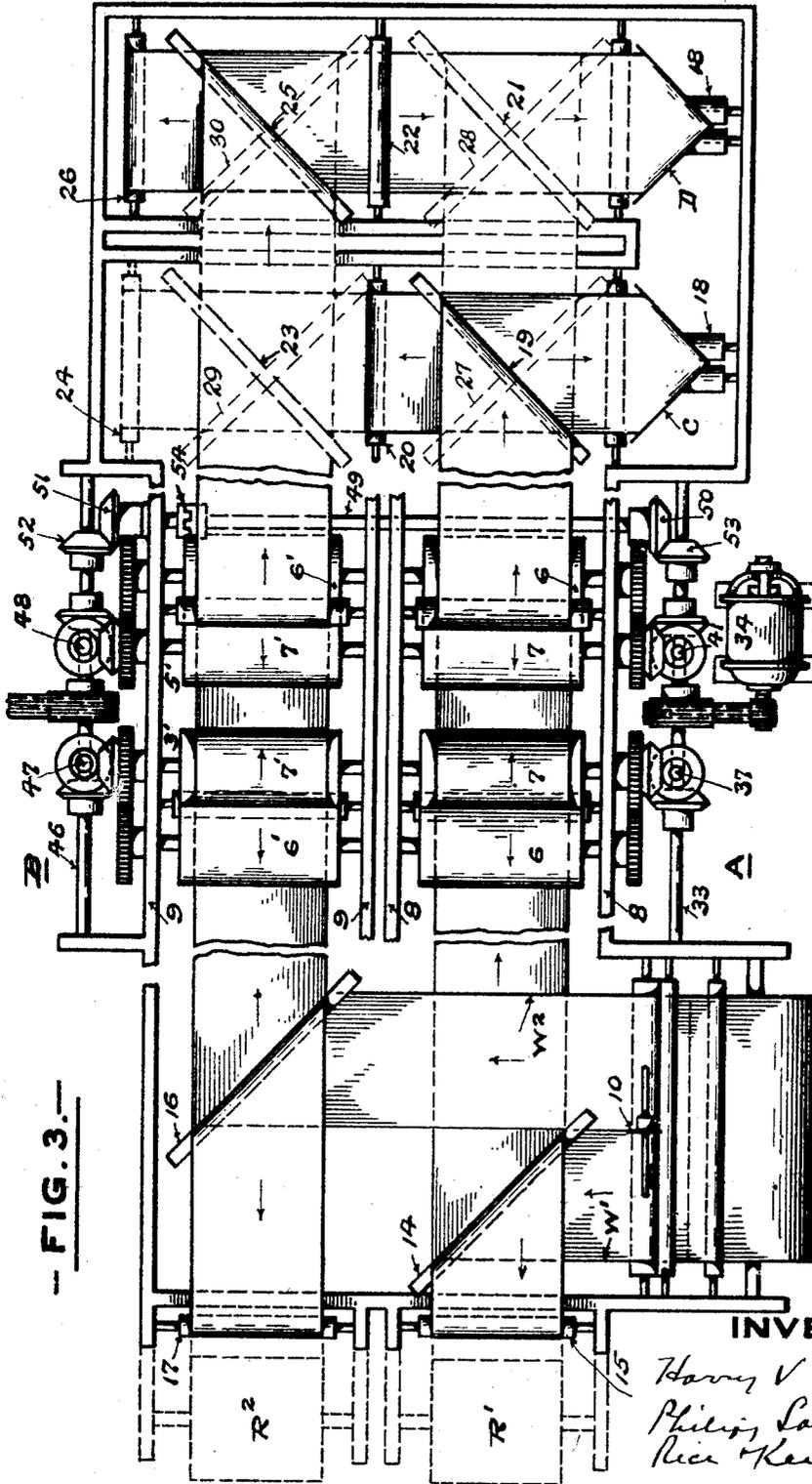


FIG. 3.

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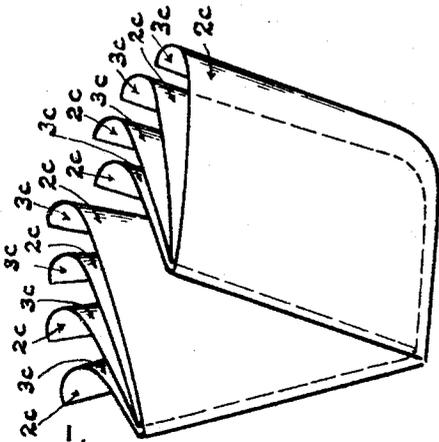
H. V. BALL

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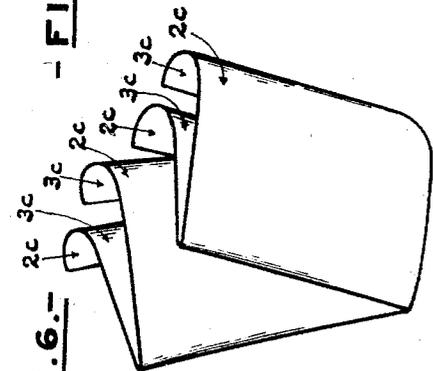
MULTICOLOR PRESS

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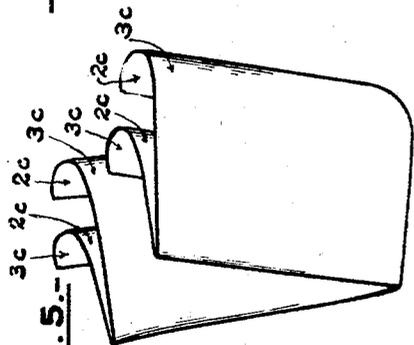
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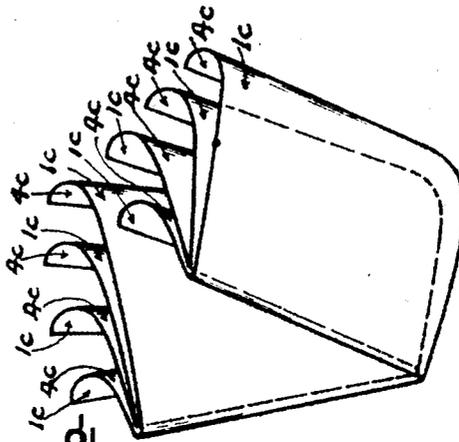
- FIG. 5. -



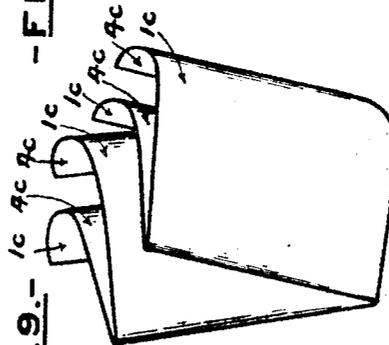
- FIG. 6. -



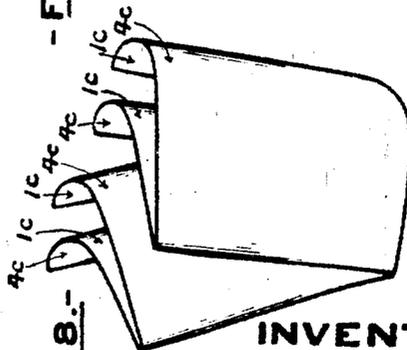
- FIG. 7. -



- FIG. 8. -



- FIG. 9. -



- FIG. 10. -

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UNITED STATES PATENT OFFICE

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MULTICOLOR PRESS

Application filed November 1, 1927. Serial No. 230,270.

This invention relates to certain improvements in multi-color printing machines.

It is the special object of the present invention to produce a printing press arrangement comprising two presses arranged side by side, the form cylinders of which are capacitated to carry two plates wide and two plates around, with folders at right angles to the presses, such press arrangement giving a wide variety of products, and products which cannot be produced with single cylinders four plates wide.

It is a further object of the present invention to produce such a color press of simple construction and compact arrangement in which there are a plurality of couples for each press with web guides for leading the webs through the couples to obtain a wide variety of color printings, and in which the direction of rotation of the cylinders may be varied as desired.

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 the drawings:—

Figure 1 is a side elevation showing diagrammatically a color press with a web lead for printing two colors on one side of a web and three colors on the other;

Figure 2 is a similar view showing a web lead for printing one color or black on one side of a web and four colors on the other;

Figure 3 is a plan view of the press arrangement shown in Figure 1, showing two two plate wide presses arranged side by side with a double folder, at right angles to the presses, with web guides for leading the webs directly to either folder or associating them at one folder, either with or without reversal;

Figure 4 is a plan view of a folding arrangement in which the webs may be led to either folder, or associating them at one of the folders, and

Figures 5 to 10 show certain of the products which can be obtained with the press arrangement shown.

Referring now to these drawings and first to Figures 1-4, the press arrangement chosen to illustrate the invention includes two presses arranged side by side, each press including five printing couples. While the number of couples may be varied, the presses will preferably be arranged side by side and the form cylinders of the couples will be capacitated to carry two plates wide and two plates around.

As shown, there are two presses A, B arranged side by side and closely adjacent, separate driving mechanism being provided for each press, so that they may be driven together or independently as hereinafter referred to. Press A includes five printing couples 1, 2, 3, 4, 5, the couples 1, 2 and 3 being arranged superposed, and the couples 4, 5 being arranged superposed at one side of the other couples. Each of the couples includes a form cylinder 6, and an impression cylinder 7, suitable inking mechanism being provided for inking the plates, this mechanism not being shown. Press B also includes five couples similarly arranged, the top couples only being shown and marked 3' and 5' in Figure 3. Each of these couples includes a form cylinder 6' and an impression cylinder 7'.

The couples and associated parts are supported in suitable framing, press A being supported in framing 8, and press B being supported in framing 9.

The form cylinders of each press are capacitated to carry two printing plates wide and two plates around. These presses are fed from suitable webs in various ways. Either a full width web roll R may be used, this web being divided by a slit 10 into two half width webs W^1 , W^2 , or two narrow or half width web rolls R^1 , R^2 may be provided, the roll R^1 supplying press A, and the roll R^2 supplying press B. Where two rolls are used, they are arranged at one end of the presses, and the webs may go directly to the presses over guide rolls 11, and under guide rolls 12, as shown in Figure 1, the webs being guided by a guide roll 13 to the lowest couple 1 of each press.

Where a wide roll R is used, the roll is po-

sitioned at one side of the press, and the webs after being split may be guided to the lowest couples 1 of each press. Web W^1 goes over a turning bar 14 and guide roll 15 under guide roll 12 to press A. Web W^2 goes over turner bar 16, guide roll 17 under guide roll 12 on the other press to press B.

In accordance with the invention, folding mechanism is provided for the presses, this folding mechanism being arranged with the folding rolls at right angles to the press. Various arrangements of the web leads to the folder may be provided, and the folder is preferably a double folder, the web guides being arranged to guide each web to a folder or to associate the webs from both presses at one folder. Referring first to Figure 1, there are provided two folders C, D, the folding rolls 18 of which are arranged at right angles to the presses. In the arrangement shown in this figure, the web W^1 after being printed and perfected as hereinafter referred to, may go over a turning bar 19, and over a reversing roll 20 of the folder C; or it may go over a turning bar 21 and over a reversing roll 22 to the folder D.

The web W^2 after being printed in press B may be led over a turning bar 23 and over a reversing roll 24, and associated with web W^1 at folder C; or it may go over a turning bar 25, and over a reversing roll 26, to folder D, where it can be associated with web W^1 at that folder when web W^1 has been led there.

If desired, web W^1 may be led over a turner bar 27 to folder C, or over a turner bar 28 to folder D, this web lead being without reversal. Likewise, web W^2 may be led over a turner bar 29 and associated with web W^1 at folder C, or can go to folder C alone, web W^1 being then led to folder D; or web W^2 may go over a turner bar 30 to folder D, either alone or associated with web W^1 at that folder, these web leads being direct without reversal, this arrangement being shown in Figure 4.

With this arrangement a wide variety of products may be obtained without any idle cylinders, and two web leads are shown as illustrative of the invention.

Referring first to Figure 1 and assuming the web leads are the same for both presses A, B, the webs are led under the guide rolls 13 up between the couples 1, 2 and 3, and from couple 3 down and then up between couples 4, 5, and then over guide roll 31 to the folders. With this run, the sides X of the webs are printed in three colors, and the sides Y perfected in two colors, and using the turner bar arrangement of Figure 3 gives the product shown in Figure 5; using the bar arrangement of Figure 4 gives the product of Figure 6; and the product of Figure 7 may be obtained by associating the webs with the bar arrangement of Figure 4 at either folder.

Referring now to Figure 2, and assuming that the web leads are the same for both presses A and B, the webs are led up under guide rolls between printing couples 3, and then down between printing couples 2, 1, then up between printing couples 4, 5, then over the guide rolls 31 to the folder. With this run the sides X of the webs receive one printing in black or color, and the sides Y receive four printings in color. Using the turner bar arrangement of Figure 4 gives the product shown in Figure 8; using the bar arrangement of Figure 3 gives the product of Figure 9, and the product of Figure 10 may be obtained at either folder by associating the webs with the turner bar arrangement of Figure 3.

It will be understood that other products may be produced in great variety with the arrangement shown. Thus, for instance, press A can be run with the web lead shown in Figure 1, and press B can be run with the web lead shown in Figure 2, the products from these two runs being delivered either separately at the folders C, D, or associated at either of the folders, and by reversing certain of the couples other products can be obtained.

Other web leads may be provided by which, for instance, four colors may be printed on each side of one of the narrow width webs. For instance, the web W^1 may be printed with four colors on one side by the couples 1, 2, 4 and 5 of press A and led over to press B and printed with four colors on the other side, this run being indicated in dotted lines in Figure 1, the web being led over press A to press B over suitable bars, indicated in dotted lines by the numeral 32. Where this lead is employed, the couples 3, 3' of presses A, B will be idle, four couples of each press only being used.

The presses may be driven in any suitable manner, but preferably this driving arrangement is such that each of the presses A, B may be driven independently or so that the presses may be driven together, and a drive for effecting this is shown in the drawings. Referring to Figure 3, the press A is driven from a line shaft 33 by means of a motor, indicated at 34. Driven from the line shaft through mitre gears 35, 36 is a vertical shaft 37, by which the couples 1, 2 and 3 are driven, the drive for these couples being from the impression cylinders by means of mitres 38, 39, 40. Driven from the line shaft 33 is a second vertical shaft 41, the drive for this shaft being effected by mitres 42, 43, which drive the impression cylinders of the couples 4, 5 by means of mitres 44, 45.

The drive for press B is the same, the press being driven from a line shaft 46, which drives two vertical shafts 47, 48, this shaft being driven by an independent motor, not shown. The cylinders of press B are driven

from a mitre arrangement the same as press A and need not again be described.

With this construction, both presses can be driven independently. For driving them together, where desired, there is provided a shaft 49 provided at each end with mitres 50, 51, which are in mesh with mitres 52, 53 on the line shafts 46, 33. A clutch, indicated at 54, is provided which when engaged permits both presses to be driven together by either motor.

As before stated, it may be desirable to reverse the direction of the drive of the couples, as shown, for instance in Figure 2, and each couple is provided with a second mitre gear, indicated by the numeral 55, for effecting this drive.

It will be seen that with the construction described a color press of great flexibility has been provided, and one which in addition to the capacity of producing products that can be produced on a four plate wide cylinder has the capacity to produce a large number of products which cannot be produced on a four plate wide cylinder without having a part of such cylinder idle.

While the invention has been shown and described in its preferred form, it will be understood that wide changes and variations may be made in the number and arrangement of the printing couples and the web leads without departing from the invention, the web leads, the products therefrom, the number and arrangement of the couples having been shown only as illustrative of the invention.

What is claimed is:

1. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples arranged end to end and independently reversible, the form cylinders of which are two plates wide, means for driving all the couples in either direction, a folding mechanism, and web guides for directing the webs from one press across to the other and to the folding mechanism.
2. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples arranged end to end and independently reversible, the form cylinders of which are two plates wide, means for driving all the couples in either direction, folding mechanism arranged at right angles to the press, and web guides for directing the webs across from one press to the other and to the folding mechanism.
3. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples independently reversible, the form cylinders of which are two plates wide and arranged end to end, means for driving all the couples in either direction, a pair of folders arranged at

right angles to the press, and web guides for leading each web to a folder and associating both webs at one folder.

4. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples arranged end to end and independently reversible, the form cylinders of which are two plates wide, web guides for leading a web through one press to print a plurality of colors on one side, web guides for leading a web across to the other press to perfect the web in a plurality of colors, and a folder to which the web is led after printing.

5. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide, means for driving the cylinders of either press in different directions, web guides for leading a web through one press to print a plurality of colors on one side, web guides for leading a web across to the other press to perfect the web in a plurality of colors, and a folder to which the web is led after printing.

6. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide and arranged end to end, folding mechanism arranged at right angles to the press, and web guides for leading the webs directly to the folding mechanism or for reversing the webs and then leading them to the folding mechanism.

7. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide and arranged end to end, means for driving the couples in either direction, folding mechanism, and web guides for leading the webs directly to the folding mechanism or for reversing the webs and then leading them to the folding mechanism.

8. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide and arranged end to end, means for driving the couples in either direction, a pair of folders arranged at right angles to the press, and web guides for leading the webs directly to either folder or associating them at one folder, or for reversing the webs and then leading them to either folder or associating them at one folder.

9. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples independently reversible, the form cylinders of which are two plates wide and arranged end to end, means capacitated for feeding to the presses a wide web and slitting it into two

narrow webs and means for feeding two narrow webs, folding mechanism arranged at right angles to the press, and web guides for directing the webs to the folding mechanism.

10. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide, means for driving the couples in either direction, means capacitated for feeding to the presses a wide web and slitting it into two narrow webs and means for feeding two narrow webs, folding mechanism, and web guides for directing the webs to the folding mechanism.

11. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide, means for driving the couples in either direction, means capacitated for feeding to the press either a wide web and slitting it into two narrow webs and means for feeding two narrow webs, a pair of folders arranged at right angles to the press, and web guides for leading a web to each folder or associating both webs at one folder.

12. In a color press, the combination of two presses arranged side by side, each including a plurality of printing couples independently reversible, the form cylinders of which are two plates wide and arranged end to end, means for driving the cylinders in either direction, a pair of folders arranged at right angles to the press, web guides for leading a web to each folder or associating both webs at one folder, and means for driving the presses separately or together.

13. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples arranged end to end and independently reversible, the form cylinders of which are two plates wide, web guides for leading a web through one press to print a plurality of colors on one side, web guides for leading the web across to the other press to perfect the web in a plurality of colors, a folder to which the web is led after printing, and means for driving the presses separately or together.

14. In a color press, the combination of two presses arranged side by side, each press including a plurality of printing couples, the form cylinders of which are two plates wide, means for driving the cylinders of either press in different directions, web guides for leading a web through one press to print a plurality of colors on one side, web guides for leading the web across to the other press to perfect the web in a plurality of colors, a folder to which the web is led after printing, and means for driving the presses separately or together.

15. In a color press, the combination of two rotary printing mechanisms arranged side by

side with the cylinders end to end, each press including a plurality of independently reversible printing couples, the form cylinders of which are two plates wide, web guides for leading a web through certain of the couples of the first press to print and perfect the web, web guides for leading a second web through certain of the couples of the second press to partially print it, and web guides for leading the second web across to the first press to further print it.

16. In combination, two rotary color presses arranged side by side with the form cylinders end to end and means for operating the presses in unison, web guides for feeding a web across from one press to another, means for reversing certain of the couples so that when all of the couples of one press are not in use in printing a web fed directly to such press such couples may be used to further print a web that has been previously printed by the other press.

In testimony whereof, I have hereunto set my hand.

HARRY V. BALL.

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