July 21, 1936. H. M. BARBER 2,048,483

WEB PERFECTING ROTARY PRESS

Filed July 27, 1935 7 Sheets-Sheet 1

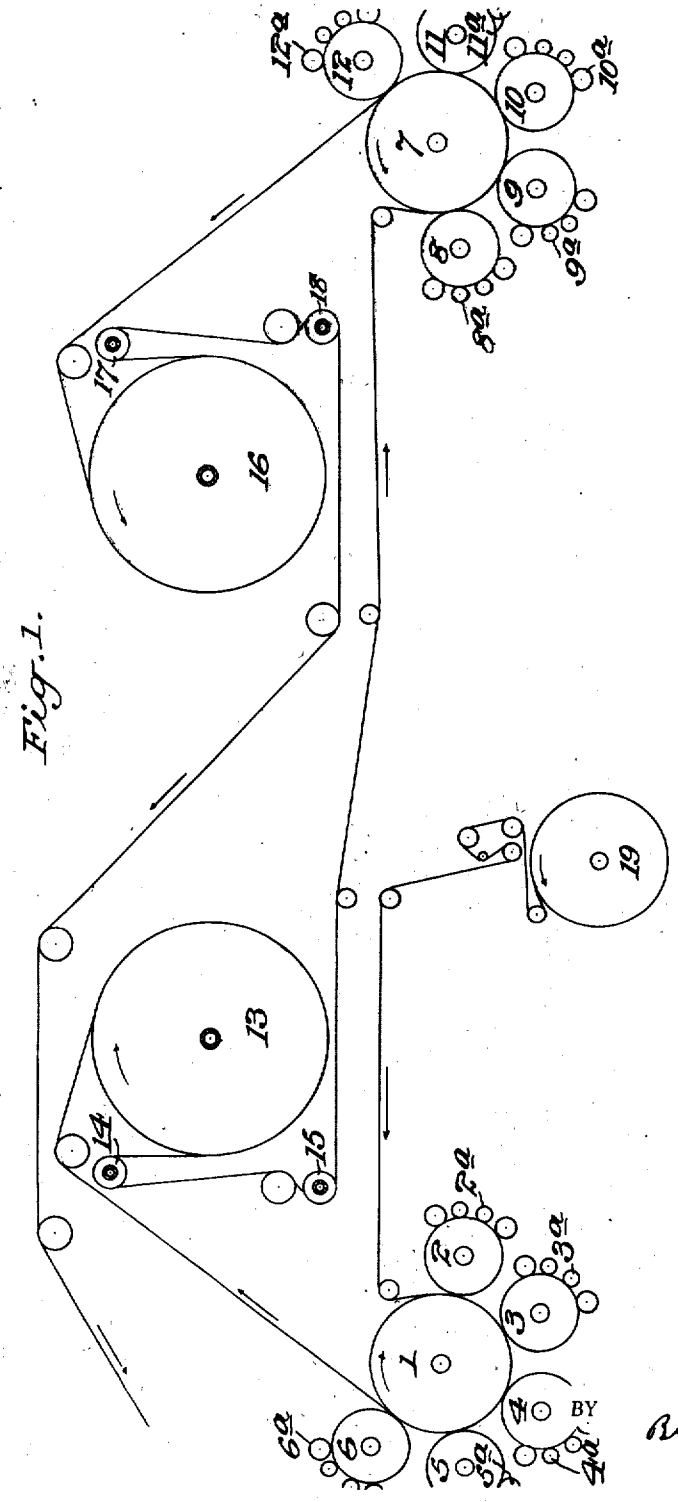


Fig. 1.

INVENTOR.
Howard M. Barber
BY
Brown & Seward
ATTORNEYS

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WEB PERFECTING ROTARY PRESS

Filed July 27, 1935 7 Sheets-Sheet 2

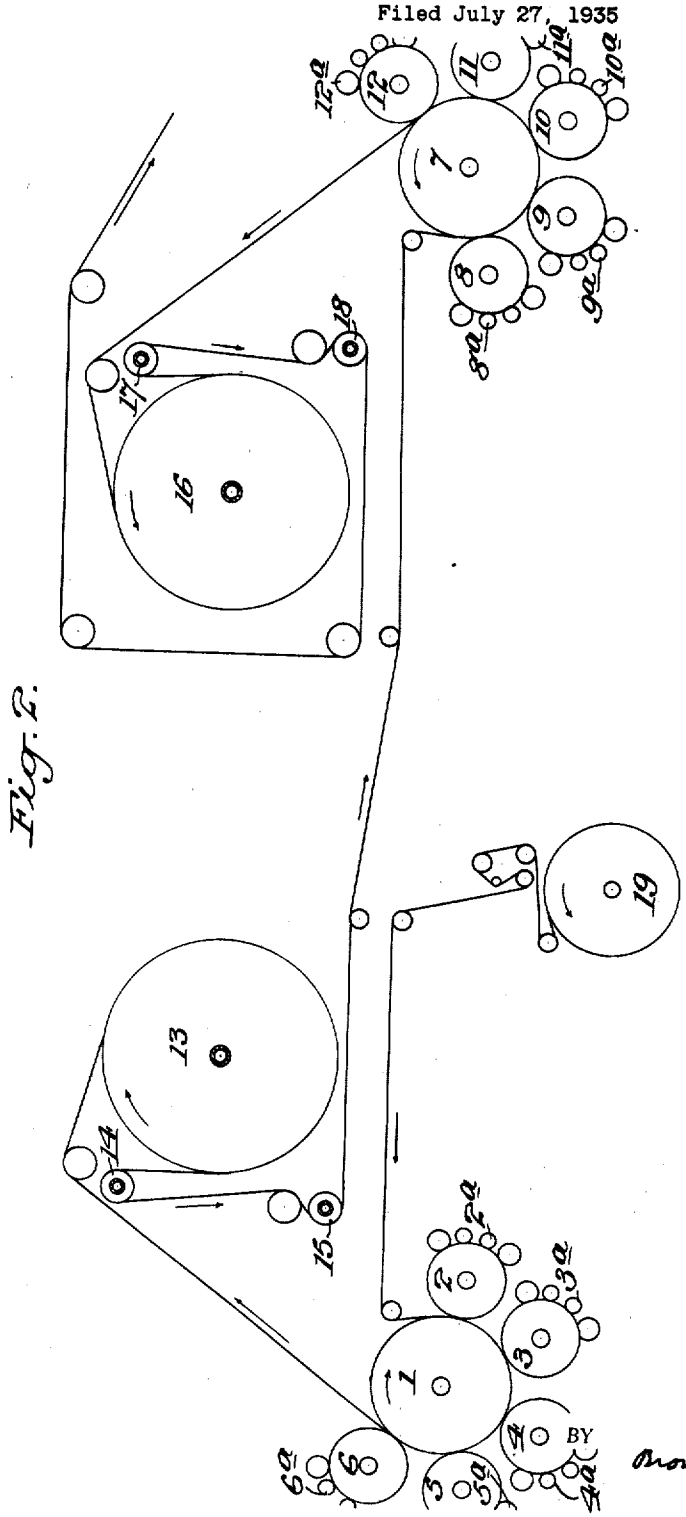


Fig. 2.

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WEB PERFECTING ROTARY PRESS

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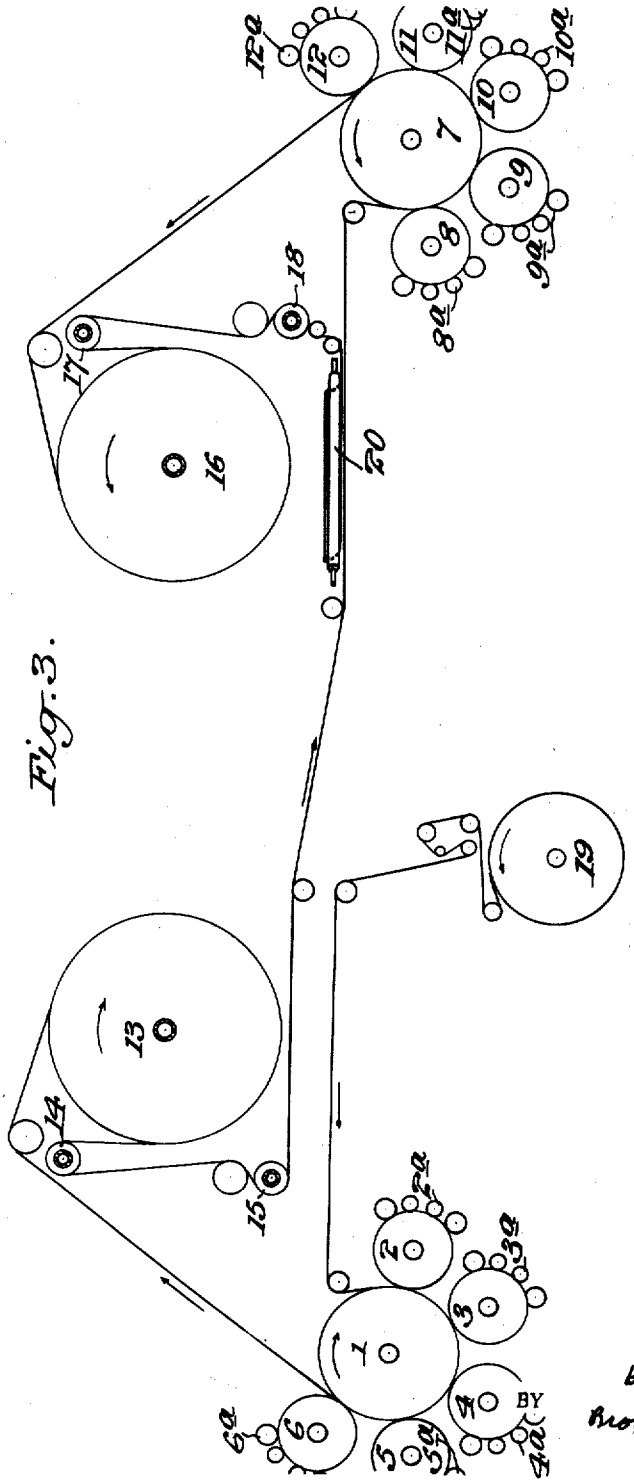


Fig. 3.

INVENTOR.
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July 21, 1936. H. M. BARBER 2,048,483

WEB PERFECTING ROTARY PRESS

Filed July 27, 1935 7 Sheets-Sheet 4

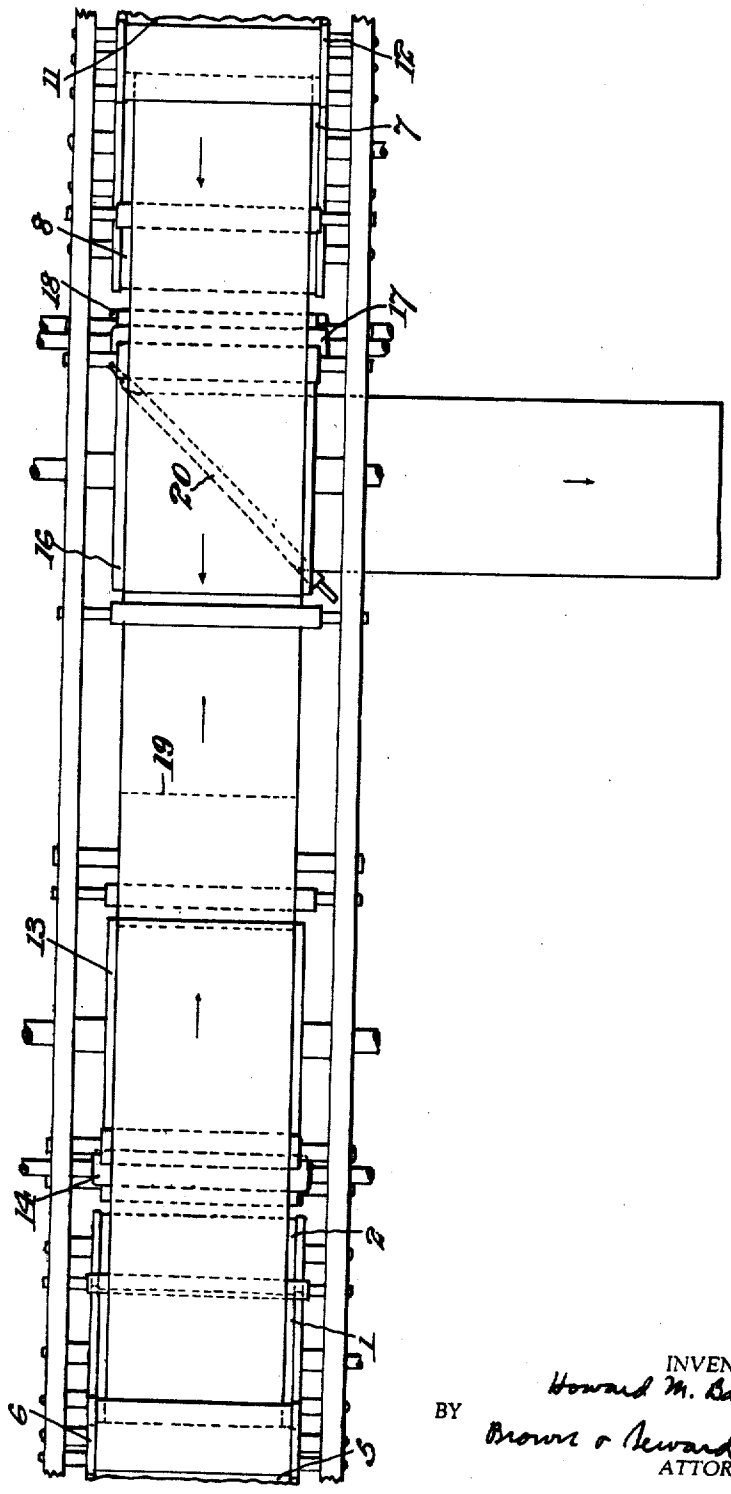


Fig. 4.

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WEB PERFECTING ROTARY PRESS

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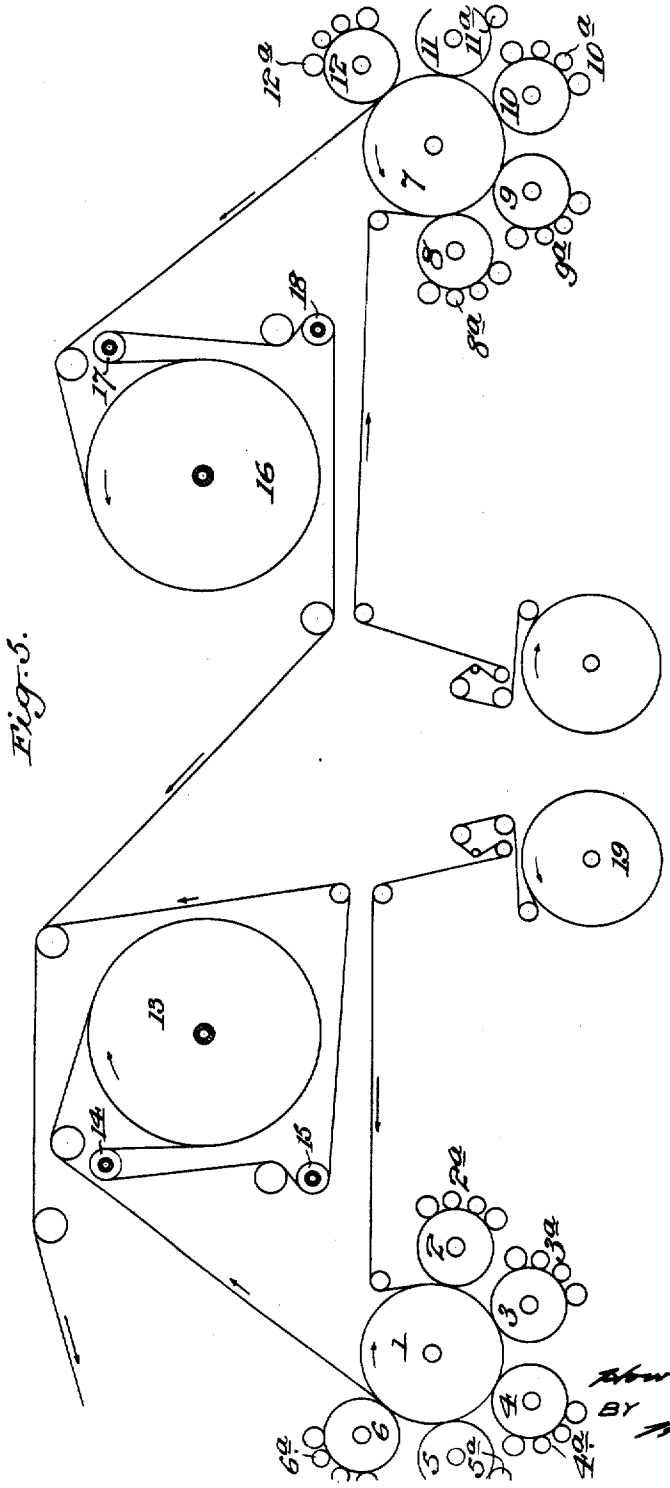


Fig. 5.

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WEB PERFECTING ROTARY PRESS

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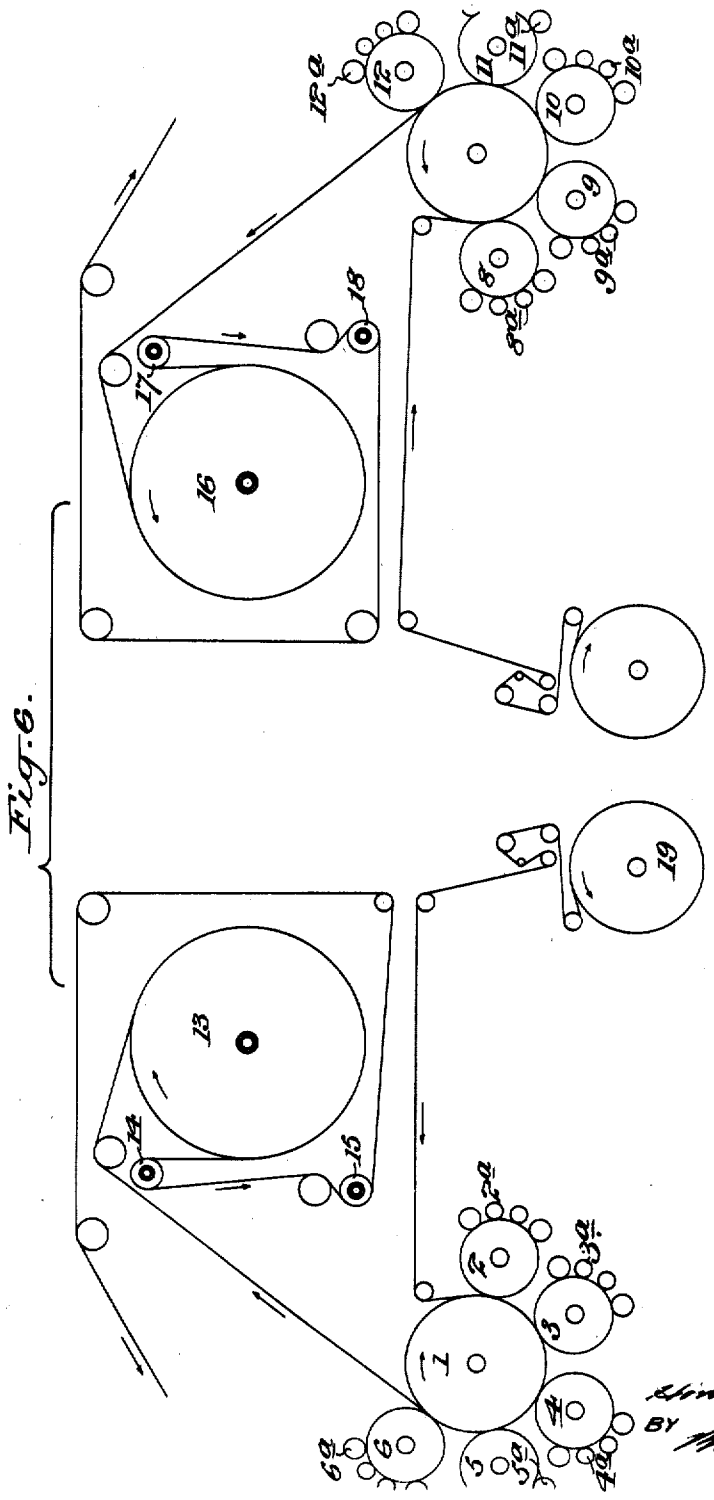


Fig. 6.

INVENTOR.
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WEB PERFECTING ROTARY PRESS

Filed July 27, 1935 7 Sheets-Sheet 7

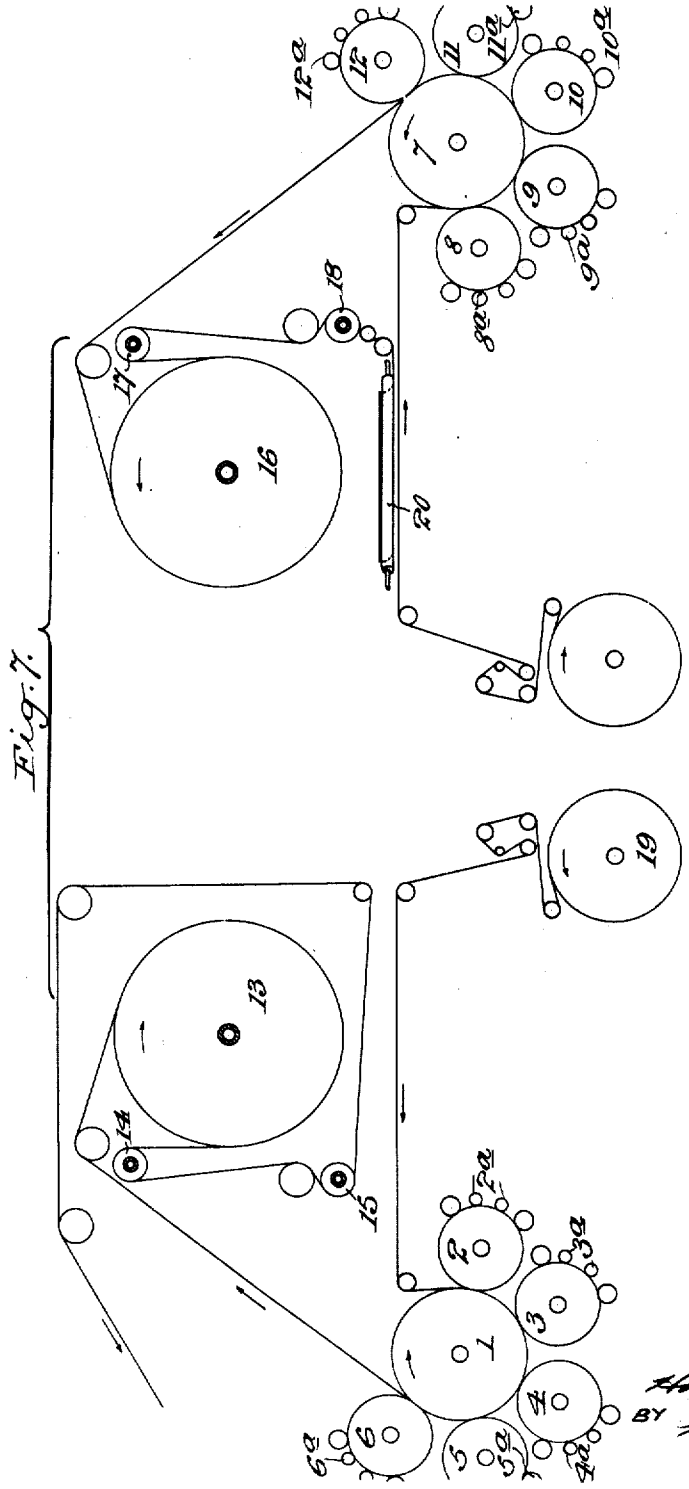


Fig. 7.

INVENTOR.
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Patented July 21, 1936

2,048,483

UNITED STATES PATENT OFFICE

2,048,483

WEB PERFECTING ROTARY PRESS

Howard M. Barber, Pawcatuck, Conn., assignor to C. B. Cottrell & Sons Company, Westerly, R. I., a corporation of Delaware

Application July 27, 1935, Serial No. 33,493

35 Claims. (Cl. 101—179)

In high speed web perfecting rotary presses where quick drying inks and web heating and cooling units are employed, it is very desirable that the several units be so located with respect to each other as to produce the best results while occupying a minimum amount of space.

The object of my invention is to so locate the printing and combined heating and cooling units, the web supply roll and the delivery, that the web can be fed and printed and the inks dried with a minimum travel of the web.

My invention comprises, generally, first and second multicolor printing units, each consisting of an impression cylinder, form cylinders arranged around their impression cylinder, inking mechanisms for the form cylinders, first and second combined heating and cooling units located preferably in the same horizontal plane, between and above the printing units and in line with the press, each combined heating and cooling unit comprising a heating cylinder and one or more (in the present instance two) cooling cylinders; and a web supply roll located in line with the press between the printing units; means being provided for passing the web from the supply roll to and through the first printing unit, then to and through the first combined heating and cooling unit, then to and through the second printing unit, then through the second combined heating and cooling unit, and finally delivered in any one of several directions, as, for instance, in line with the press adjacent the first printing unit, or in line with the press adjacent the second printing unit, or at a point offset from and at right angles to the press.

Practical embodiments of my invention are represented in the accompanying drawings, in which

Fig. 1 represents a diagrammatic side elevation of one form of my invention in which the perfected web is delivered adjacent the first printing unit;

Fig. 2 represents a similar view in which the perfected web is delivered adjacent the second printing unit;

Fig. 3 represents a similar view in which the web is delivered at a point offset from and at right angles to the printing units;

Fig. 4 represents a top plan view of the form illustrated in Fig. 3;

Fig. 5 represents a diagrammatic side elevation in which two non-perfected webs are delivered adjacent one printing unit in line with the press;

Fig. 6 represents a similar view in which two non-perfected webs are delivered adjacent their respective printing units, in line with the press; and

Fig. 7 represents a similar view in which two non-perfected webs are delivered, one adjacent to its printing unit in line with the press and the other adjacent to the other printing unit, at right angles to the press.

The first printing unit is herein represented as a five color unit, the impression cylinder being denoted by 1 and its five form cylinders 2, 3, 4, 5, 6, which form cylinders are arranged around the impression cylinder 1 in the present instance two on one side and three on the other side of the impression cylinder. The inking mechanisms for the five form cylinders are denoted by 2a, 3a, 4a, 5a, 6a, which inking mechanisms apply the inks to their respective form cylinders in the usual manner.

The second printing unit for perfecting the web is herein represented as a five color unit, the impression cylinder being denoted by 7 and its five form cylinders by 8, 9, 10, 11, 12, which form cylinders are arranged around the impression cylinder 7. The inking mechanisms for the form cylinders are denoted by 8a, 9a, 10a, 11a, 12a, which inking mechanisms apply the inks to their respective form cylinders in the usual manner.

These two printing units are preferably located in substantially the same horizontal plane at the required distance apart.

The first combined heating and cooling unit is herein represented as comprising a large heating cylinder 13 and two small cooling cylinders 14, 15, arranged at one side of the heating cylinder (preferably the left side) and spaced the required distance apart.

The second combined heating and cooling unit is herein represented as comprising a large heating cylinder 16 and two small cooling cylinders 17, 18, arranged at one side of the heating cylinder (preferably the right side) and spaced the required distance apart.

These two combined heating and cooling units are located above the printing units in line with the press and they are in substantially the same horizontal plane.

The web supply roll is denoted by 19 and it is located between the two printing units in line with the press.

The web is led through the press as follows: The unprinted web passes from the supply roll 19 to and through the first printing unit where the web is printed in multicolor upon one side thereof. The web is then led to and around the heating cylinder 13 and the cooling cylinders 14,

15 of the first combined heating and cooling unit. From thence the web is led to and through the second printing unit where the web is printed in multicolor on its other side. The perfected web is then led to and around the heating cylinder 16 and the cooling cylinders 17, 18 of the second combined heating and cooling unit.

The perfected web may be delivered from the second combined heating and cooling unit to different points, as desired. In Fig. 1 the web is shown as delivered at the end adjacent the first printing unit in line with the press. In Fig. 2 the web is shown as delivered at the end adjacent the second printing unit in line with the press. In Figs. 3 and 4 the web is shown as delivered, by the use of a turning bar 20, at right angles to the press within its longitudinal confines, at one side, adjacent the second printing unit.

The means for driving the several units is not shown or described herein, it being understood that the first and second units may be driven separately either for the purpose of "making ready" or for permitting a single or two separate nonperfected multicolor products to be produced. In the latter event an additional web supply roll and different web paths, as indicated in Figs. 5, 6 and 7, may be used.

It will be understood that guide rolls are provided for passing the web in prescribed paths from the web supply roll 19 to the delivery point.

It will also be understood that any suitable heating medium, such as steam, may be supplied to the heating cylinders 13 and 16 and that any suitable cooling medium, such as water, may be supplied to the cooling cylinders 14, 15 and 17, 18.

It will also be understood that any well known or approved quick drying inks may be used in the printing units.

From the above description it will be seen that I have provided an arrangement of the several units of the press whereby the inks on the freshly printed side of the web may be thoroughly dried with a minimum travel of the web, the form cylinders of the two printing units at the same time being so positioned that ready access thereto may be obtained.

Where the web is passed beneath the heating cylinders of the first and second combined heating and cooling units, on its way from the cooling cylinders, the tendency of the ink to become soft, because of the heat rising from the heating cylinders, is obviated.

It will also be understood that where it is desired to print in four colors upon each side of the web, one form cylinder in each printing unit may be omitted or rendered inoperative; as for instance the form cylinder 6 of the first printing unit and the form cylinder 12 of the second printing unit; thus leaving four form cylinders arranged around the under side of the impression cylinder of each printing unit. It will also be understood that if it be desired to print four colors upon one side and five colors upon the opposite side of the web, a form cylinder of one of the printing units may be omitted or rendered inoperative.

What I claim is:

1. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web.

2. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web in line with the press adjacent the first printing unit.

3. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web in line with the press adjacent the second printing unit.

4. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web at right angles to the press adjacent the second printing unit.

5. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located above the printing units, and means for leading the web through said units and delivering the web.

6. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located above and between the printing units, and means for leading the web through said units and delivering the web.

7. In a web perfecting rotary press, first and second multicolor printing units, first and second combined heating and cooling units located above and between the printing units, a web supply roll, and means for leading the web from the supply roll through said units and delivering the web.

8. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, first and second combined heating and cooling units located in substantially the same horizontal plane between the printing units and in line with the press, and means for leading the web through said units and delivering the web.

9. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, first and second combined heating and cooling units located in substantially the same horizontal plane above the printing units and in line with the press, and means for leading the web through said units and delivering the web.

10. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, first and second combined heating and cooling units located in substantially the same horizontal plane above and between the printing units and in line with the press, and means for leading the web through said units and delivering the web.

11. In a web perfecting rotary press, first and second five color printing units, first and second combined heating and cooling units, and means for leading the web through said units and delivering the web.

12. In a web perfecting rotary press, first and second five color printing units located in substantially the same horizontal plane, first and second combined heating and cooling units located in substantially the same horizontal plane above and between the printing units and in line with the press, a web supply roll, and means for leading the web from the supply roll through said units and delivering the web.

13. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, first and second combined heating and cooling units located in substantially the same horizontal plane above and between the printing units in line with the press, a web supply roll, and means for passing the web from the supply roll to and through the first printing unit under the first heating and cooling unit, then to and through the first heating and cooling unit, then under the first and second heating and cooling units to and through the second printing and heating and cooling units, and then under the second heating and cooling unit to a delivery point.

14. In a web perfecting rotary press, first and second multicolor units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web.

15. In a web perfecting rotary press, first and second multicolor units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web in line with the press adjacent the first printing unit.

16. In a web perfecting rotary press, first and second multicolor units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web in line with the press adjacent the second printing unit.

17. In a web perfecting rotary press, first and second multicolor units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located between the printing units, and means for leading the web through said units and delivering the web at right angles to the press adjacent the second printing unit.

18. In a web perfecting rotary press, first and second multicolor printing units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located above the printing units, and means for leading the web through said units and delivering the web.

19. In a web perfecting rotary press, first and second multicolor printing units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located above and between the printing units, and means for leading the web through said units and delivering the web.

20. In a web perfecting rotary press, first and second multicolor printing units, each comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located above and between the printing units, a web supply roll, and means for leading the web from the supply roll through said units and delivering the web.

21. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, each printing unit comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located in substantially the same horizontal plane between the printing units and in line with the press, and means for leading the web through said units and delivering the web.

22. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, each printing unit comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located in substantially the same horizontal plane above the printing units and in line with the press, and means for leading the web through said units and delivering the web.

23. In a web perfecting rotary press, first and second multicolor printing units located in substantially the same horizontal plane, each printing unit comprising an impression cylinder and form cylinders arranged around the underside thereof, first and second combined heating and cooling units located in substantially the same horizontal plane above and between the printing units and in line with the press, and means for leading the web through said units and delivering the web.

24. In a web perfecting rotary press, first and second four color printing units, first and second combined heating and cooling units, and means for leading the web through said units and delivering the web.

25. In a web perfecting rotary press, first and second four color printing units, each comprising an impression cylinder and four form cylinders arranged around the underside thereof, first and second combined heating and cooling units, and means for leading the web through said units and delivering the web.

26. In a web perfecting rotary press, first and second four color printing units located in substantially the same horizontal plane, each printing unit comprising an impression cylinder and four form cylinders arranged around the underside thereof, first and second combined heating and cooling units located in substantially the same horizontal plane above and between the printing units and in line with the press, a web supply roll, and means for leading the web from the supply roll through said units and delivering the web.

27. In a web perfecting rotary press, first and second four color printing units located in substantially the same horizontal plane, each printing unit comprising an impression cylinder and four form cylinders arranged around the underside thereof, first and second combined heating and cooling units located in substantially the same horizontal plane above and between the printing units in line with the press, a web supply roll, and means for leading the web from the supply roll to and through the first printing unit under the first heating and cooling unit, then under the first and second cooling units to and through the second printing and heating and cooling units, and then under the second heating and cooling unit to a delivery point.

28. In a multicolor rotary non-perfecting web printing press, a printing unit located at one end of the press and comprising an impression cylinder and form cylinders arranged around its

side, a web supply roll located in line with the press, a combined heating and cooling unit located between the supply roll and the printing unit, said heating and cooling unit comprising a heating cylinder and one or more cooling cylinders, and means for delivering the web in a path leading under the heating and cooling unit.

29. In a multicolor rotary non-perfecting web printing press, a printing unit located at one end of the press and comprising an impression cylinder and form cylinders arranged around its side, a web supply roll located in line with the press, a combined heating and cooling unit located between and above the supply roll and the printing unit, said heating and cooling unit comprising a heating cylinder and one or more cooling cylinders, and means for delivering the web in a path leading under the heating and cooling unit.

30. In a multicolor rotary non-perfecting web printing press, a printing unit located at one end of the press and comprising an impression cylinder and form cylinders arranged around its side, a web supply roll located in line with the press, a combined heating and cooling unit located between the supply roll and the printing unit, said heating and cooling unit comprising a heating cylinder and one or more cooling cylinders, and means for delivering the web in a path leading under the heating and cooling unit at the end of the press adjacent the printing unit.

31. In a four color rotary non-perfecting web printing press, a printing unit located at one end of the press and comprising an impression cylinder and four form cylinders arranged around its under side, a web supply roll located in line with the press, a combined heating and cooling unit located between and above the supply roll and the printing unit, said heating and cooling unit comprising a heating cylinder and one or more cooling cylinders located on the side of the heating cylinder toward the printing unit, and means for delivering the web in a path leading under the heating and cooling unit.

32. In a multicolor rotary printing press, a printing unit located at one end of the press, a combined heating and cooling unit located at the opposite end of the press and a web supply roll, all located in line with the press, and means for leading the web through the printing and combined heating and cooling units and delivering the web, the said printing unit comprising an impression cylinder and five form cylinders arranged around the same.

33. In a multicolor rotary printing press, a printing unit located at one end of the press, a combined heating and cooling unit located at the opposite end of the press and a web supply roll, all located in line with the press, and means for leading the web through the printing and combined heating and cooling units and delivering the web, the said printing unit comprising an impression cylinder and five form cylinders arranged around the same, two form cylinders upon one side and three form cylinders upon the other side of the impression cylinder.

34. In a multicolor rotary printing press, a printing unit located at one end of the press, a combined heating and cooling unit located at the opposite end of the press and a web supply roll, all located in line with the press, the web supply roll being located below the printing and combined heating and cooling units, and means for leading the web through the printing and combined heating and cooling units and delivering the web in a path passing under the heating and cooling unit, said printing unit comprising an impression cylinder and five form cylinders arranged around the same.

35. In a multicolor rotary printing press, a printing unit located at one end of the press, a combined heating and cooling unit located at the opposite end of the press and a web supply roll, all located in line with the press, the web supply roll being located below the printing and combined heating and cooling units and beyond the printing unit, and means for leading the web through the printing and combined heating and cooling units and delivering the web in a path passing under the heating and cooling unit at the end of the press occupied by the heating and cooling unit, said printing unit comprising an impression cylinder and five form cylinders arranged around the same.

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