Nov. 10, 1936. H. A. W. WOOD 2,060,359

WEB SPLICING DEVICE

Original Filed Oct. 27, 1932 3 Sheets-Sheet 1

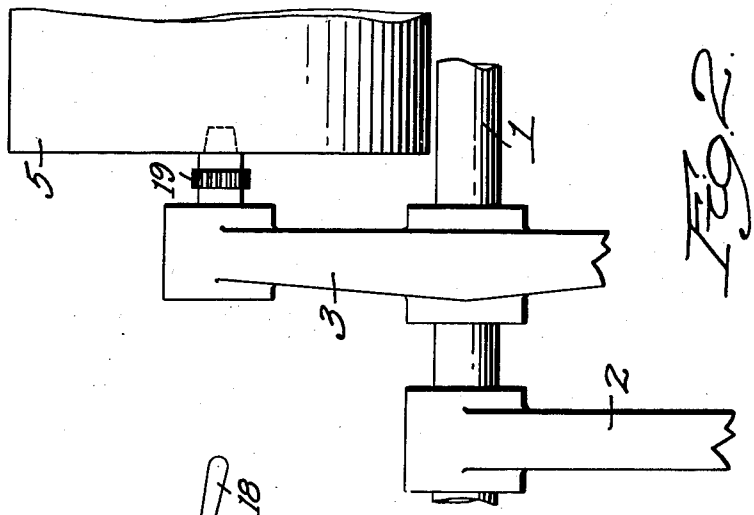


Fig. 2

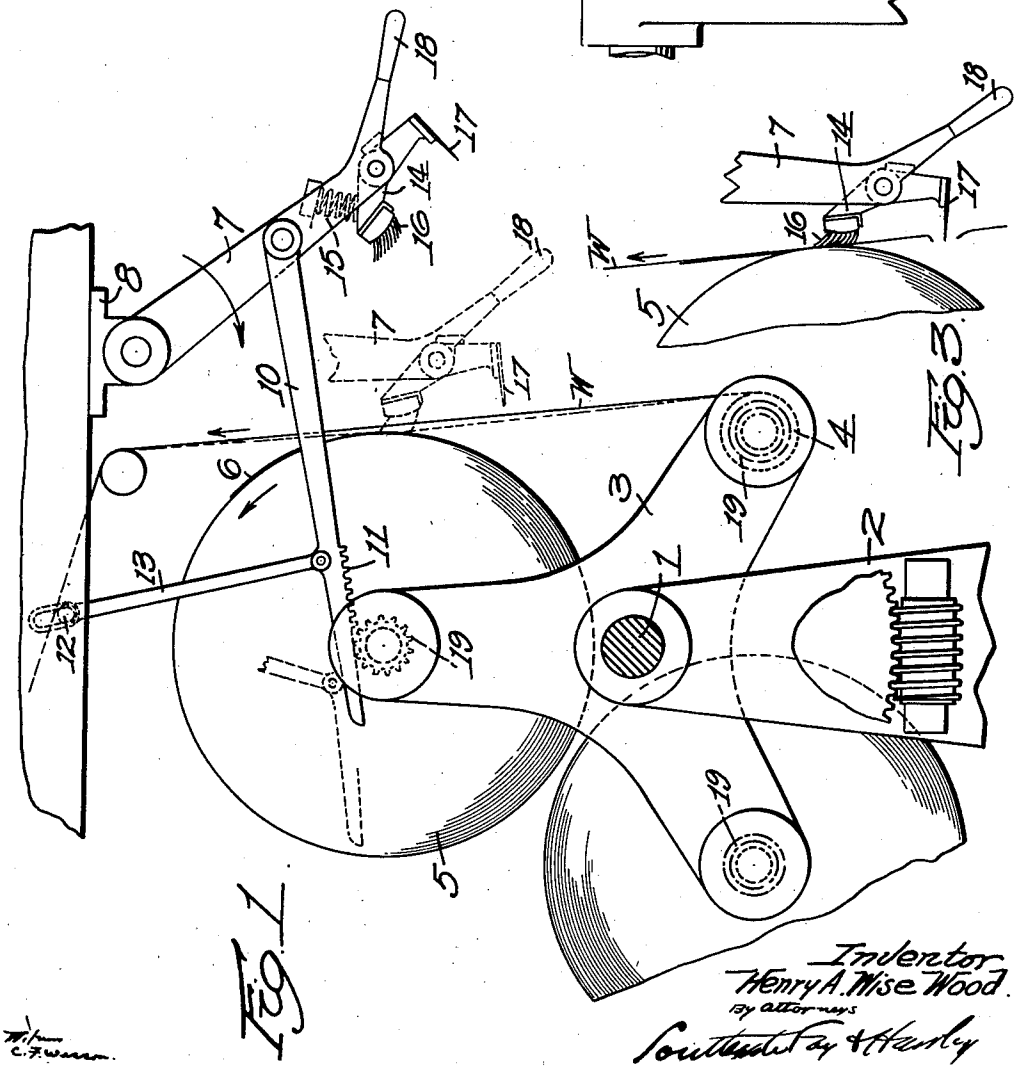


Fig. 1

Fig. 3

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WEB SPLICING DEVICE

Original Filed Oct. 27, 1932 3 Sheets-Sheet 2

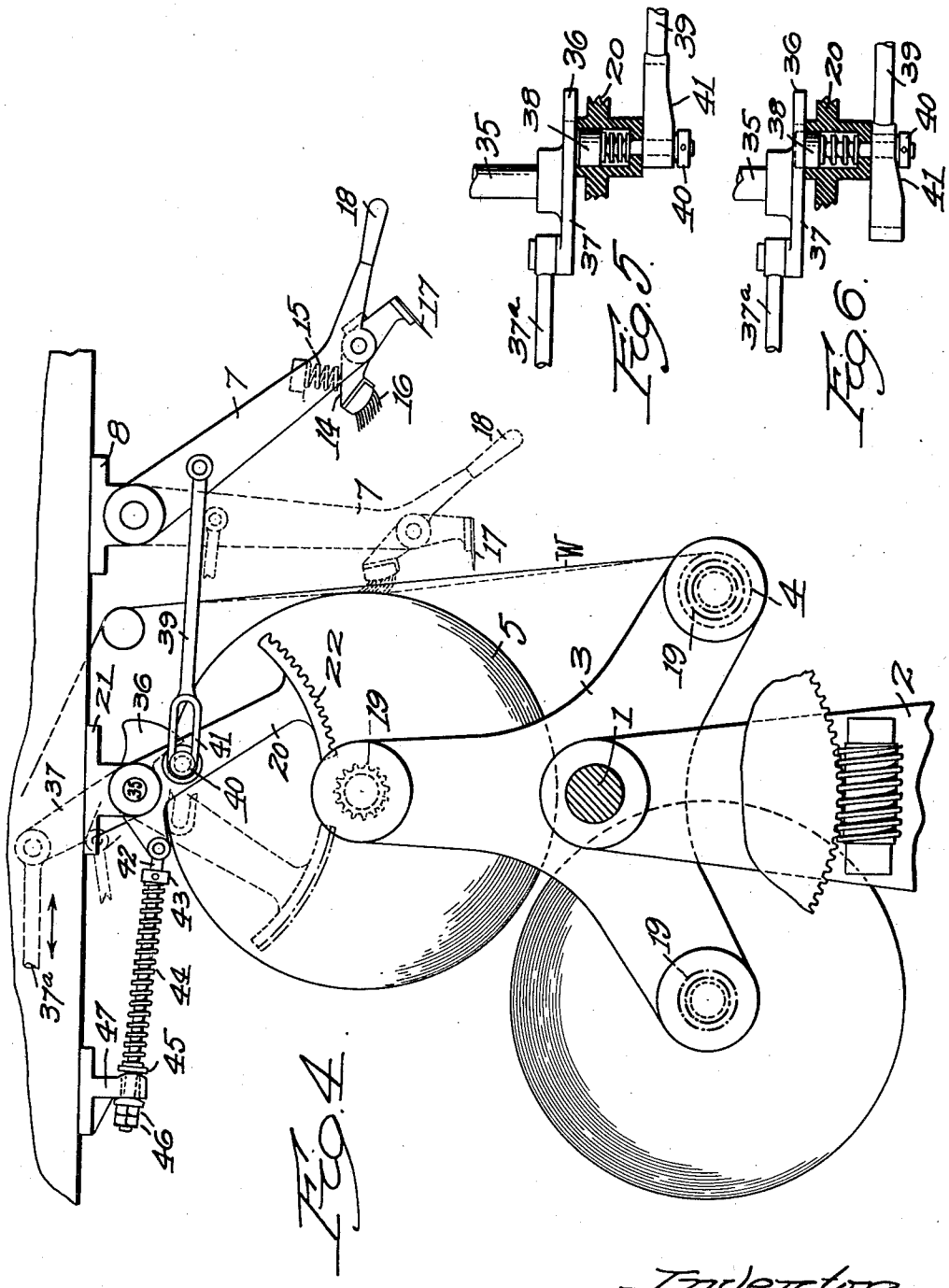


Fig. 4

Fig. 5

Fig. 6

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WEB SPLICING DEVICE

Original Filed Oct. 27, 1932 3 Sheets-Sheet 3

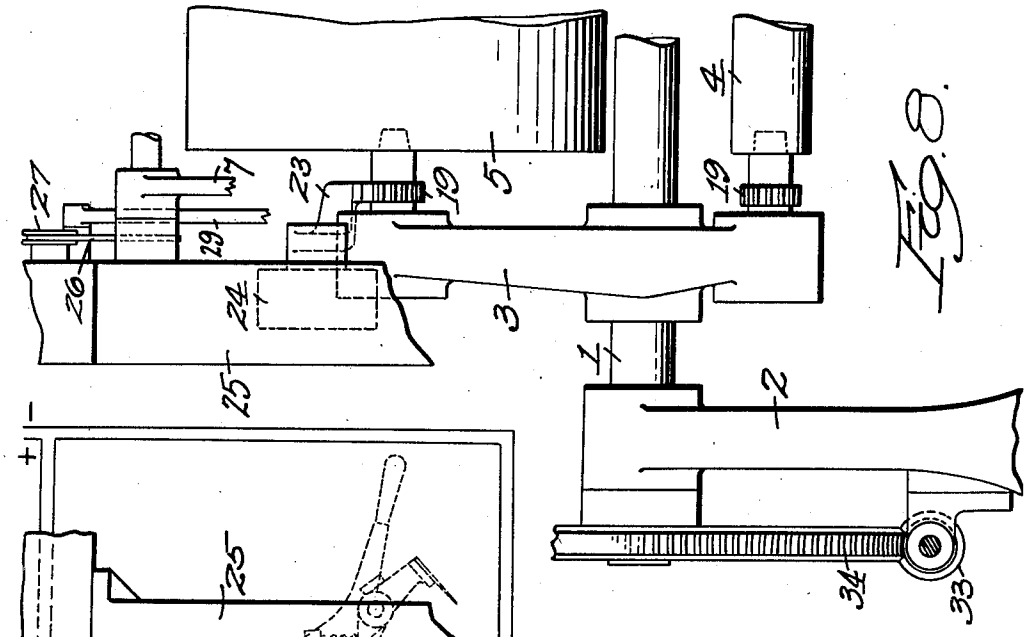


Fig. 8.

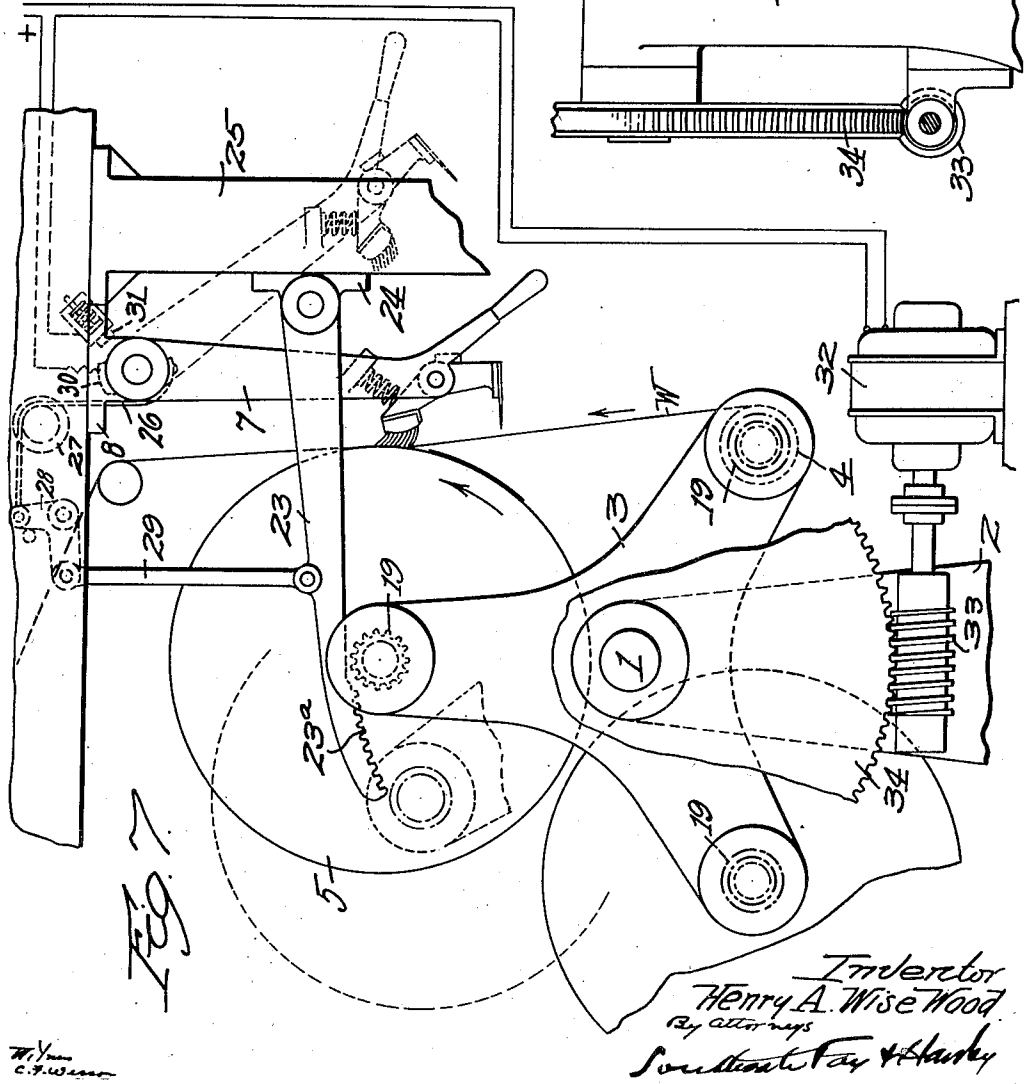


Fig. 7.

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UNITED STATES PATENT OFFICE

2,060,359

WEB SPLICING DEVICE

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Application October 27, 1932, Serial No. 639,786
Renewed September 3, 1935

19 Claims. (Cl. 242—58)

The principal object of this invention is to provide a pasting device for splicing newspaper printing machine webs which is intermediate between the two types of pasters that have been produced heretofore.

It is designed to avoid the necessity of stopping the press during the pasting but at the same time to contain simpler mechanism than is necessary when the web is spliced at full web speed. The invention involves the imparting to the incoming roll of rotation by force applied to it other than through the running web itself and giving the incoming roll a start to relieve some of the strain on the web at the time of pasting.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is an end view of a reel for supporting a plurality of web rolls with a form of splicing device applied thereto and having means for starting up the new roll at the time of the pasting operation;

Fig. 2 is a front elevation thereof;

Fig. 3 is a view similar to Fig. 1 showing the final act of performing the pasting operation, namely the separation of the web;

Fig. 4 is a view similar to Fig. 1 showing a modification;

Figs. 5 and 6 are sectional views showing a connecting element which is used in this form of the device;

Fig. 7 is a view similar to Fig. 1 and Fig. 4 showing another modified form, and

Fig. 8 is a front view of the same.

It has long been the practice in the newspaper printing industry to splice paper rolls without stopping the press. In general this has been done in connection with a rotatable reel carrying a plurality of web rolls. This splicing, however, has been done at the threading speed, which is very slow. Since the decelerating and accelerating of the press for the making of a slow speed paster absorbs considerable time, automatic machines have been developed for making these splices with the web running at the full speed of the press. Such a machine naturally is more or less complicated.

This invention is designed to fill the gap between the very slow speed paster and the entirely automatic paster. The purpose of the invention is to increase the productiveness of the press by avoiding the slowing down to threading speed while still retaining a simple device for the pasting operation. Very often with the slow speed pasters, only the strength of the paper is used in bringing the incoming roll up to the desired speed. According to the present invention the force of rotation is applied to the incoming roll by external means instead of through the web.

The invention can be carried out in many forms. It can be operated by the lowering of the web pressing member to speed up the incoming roll through power furnished by the operator or it can be speeded up from the drive of the press proper or from the rotation of the reel, or in other ways.

In Figs. 1, 2 and 3 is shown an example of the first of the above mentioned ways of operating. The invention is shown as applied to a reel made up of spiders **3** carried on a central shaft **1** on supporting members **2**. In this case three web rolls can be supported on the reel. The web is fed from the butt **4** of the exhausting roll to the printing press in the conventional manner over a guide roll. The incoming web roll **5** is brought to the position shown with the pasted end **6** in approximately the position shown.

A brush frame **7** is shown pivoted above on brackets **8** carried by the frame of the press. It is normally held back in inoperative position, as shown in full lines in Fig. 1. Pivoted to this frame is a rack arm **10** carrying rack teeth **11**. It is pivotally hung from above by a link **13** having a slot and stud arrangement **12** by which it is connected with the press frame to prevent the lowering of the rack below a certain level. It permits a limited up and down motion of the rack about its pivot on the frame **7**.

This frame carries the usual brush lever **14** pivotally mounted thereon and normally forced downwardly by springs **15**. A brush or brushes **16** are mounted on the lever **14** at one end and it has a severing knife **17**.

When the splice is about to be made the operator grasps the handle **18** of the brush frame and moves the brush frame **7** from the full line to operative or dotted line position shown in Fig. 1. This brings the brushes into contact with the running web W and ready to force that web out of its line of travel into contact with the roll **5**. However, before this occurs the movement of the rack arm **10** caused by the swinging of the frame **7** will cause the teeth **11** to rotate a pinion **19** which is fixed to the stud of the incoming roll **5** and start that roll rotating on its axis. Thus by the operation of the brush frame into operative position the new roll is rotated at a speed considerably higher than that of threading and the web is pressed against the new roll to form a paster when

the pasted end 6 comes around into contact with it.

It will be seen that the speeding up of the incoming roll is an operation that is performed by hand and is performed by the action of pressing the web against that roll. The pasting operation is assisted materially by the rotation imparted to the new roll by the rack and pinion. This removes much of the strain on the incoming roll when the paster is made and permits the making of successful pasters at speeds materially higher than the threading speed.

In Figs. 4, 5 and 6 another way of carrying out the invention is shown. The reel is shown rotated by a worm as usual and the brush arm is shown with the parts previously described. A segment gear 20 is pivotally mounted on a shaft 35 supported by brackets 21 secured to the frame of the press. A cam lever 36 is also pivotally mounted on the shaft 35 and has one end pivotally connected with the press by an arm 37. On the press are connections in the form of a crank or otherwise so that when the press is running a link 37a reciprocates and oscillates the cam lever 36 continuously. The cam lever 36 normally oscillates idly, but is connected detachably with the segment arm 20 by a spring-pressed engaging pin 38 mounted in a recess in the segment arm 20 and penetrating a slot in one end of a link 39. The other end of this link is pivotally secured to the brush arm 7 and moves with it. It is provided with a collar 40 for operation by an inclined cam surface 41 on the link 39. The collar 40 is located on the end of a rod which carries the pin 38. In the position shown in Fig. 5 this pin is pulled out while in the position shown in Fig. 6, the spring behind it pushes it in.

By means of a push rod 42, collar 43, spring 44, washer 45, lock nuts 46 and a bracket 47, secured to the press frame, the segment arm 20 is spring-pressed in either of its extreme positions. The segmental row of teeth 22 on the gear 20 are provided for cooperation with the pinion 19 secured to the spindle of the incoming roll, as in the other form described, for giving this roll 5 a start at the time of splicing.

When the brush arm 7 is moved inwardly by hand from the full line position in Fig. 4 to the dotted line position, the link 39 is moved inwardly from the position shown in Fig. 5 to that shown in Fig. 6. This releases the pin 38 and it comes into a plane in which it will engage the edge of the lever 36. As that cam lever is being oscillated the segment arm 20 is given a rapid oscillation from the full line to the dotted line position in Fig. 4 and rotates the roll 5. This automatically disconnects the pin 38 from the cam lever 36 at the end of the stroke and the action is not again repeated until the brush arm 7 is raised to the inoperative position and lowered again as thus described. It may be raised at any time after the roll 5 is brought around to the running position.

It will be seen that this mechanism is operated in a manner similar to that described in connection with the first three figures of the drawings because assistance is given to the web in bringing the new roll up to speed and this is initiated by hand operation. As in the other case the application of further pressure on the brush 16 compresses the springs 15 and permits the knife 17 to sever the web. In this case the motion of the starting up of the roll is initiated as before by the movement of the brush frame down to pasting position but the actual power for rotating it is imparted from the press through the lever 37.

In the form shown in Figs. 7 and 8 the rotation of the reel itself is used to start the incoming roll into rotation. Many of the parts shown on this sheet are the same as described above and will not be described over again. In this case a rack arm 23 is pivoted on a bracket 24 carried by the press column 25. This rack arm 23 carries teeth 23a for cooperating with the pinion 19 which is in the same relation to the other parts as described above. In this case, however, just prior to splicing, the spindle of the incoming roll 5 is in the dotted line position in Fig. 7. By lowering the brush frame 7 to the full line position shown in these figures by hand as before, a chain 26, connected with the hub of the frame 7, is operated. This chain passes over a sheave 27 connected with a bell crank 28. This bell crank is provided with a link 29 pivoted thereto and pivoted to the rack arm 23. Therefore, the lowering of the frame 7 to operative position also lowers the rack 23a.

At the moment that the brush 16 contacts with the web W an electric contact 30 carried by the brush arm touches a contact 31 mounted on the bracket 8. This closing of the open circuit in which these contacts are located starts the motor 32 which is also in this circuit. This motor, through a worm 33 and worm wheel 34, which is secured to the shaft 1 of the reel in the usual way, rotates the reel. This rotation of the roll 5 bodily from the dotted line to the full line position in Fig. 7 with the rack in engagement with the pinion gives the incoming roll 5 a start in the direction indicated by the arrow. This, as in the other cases, removes the strain from the web W as the brush 16 presses this web against the incoming roll. In this case, instead of rotating the roll directly by the movement of the brush frame or by the power of the press, the power for rotating the roll is provided by the rotation of the reel caused by the motor. In this case the web is severed as in the other cases.

It will be seen that in all these cases the movement of the brush frame toward pasting position at least initiates the rotation of the fresh roll on its own axis to relieve the strain on the running web when it is united with this roll. In the first case the movement of the frame not only initiates but completes the action of rotating the new roll. In the second case the power for rotating this roll is imparted by the press and in the third case by the reel. In all cases the incoming roll is started into rotation by force applied to it by other means than the running web itself and that means is very simple. Furthermore this invention provides a practical means for speeding up the pasting operation from the slow speed mechanism heretofore provided for that purpose, without the necessity of all the complication of the automatic mechanism required in automatically pasting at full web speed. This invention fills the gap between these two extremes and permits the medium sized plants to perform a paster without much loss of time and without burdening them with excessive expense.

Although I have illustrated and described only three forms of the invention I am aware of the fact that other modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish

to be limited in this respect otherwise than as set forth in the claims, but what I do claim is:

1. In a web pasting device for a printing press, the combination of means for supporting a fresh web roll and a movable frame provided with means for pressing the running web against the fresh web roll, of means initiated by the movement of the frame into web pressing position for imparting a momentary motion of rotation on its own axis to the fresh web roll at the time of pasting, whereby the strain on the web when it picks up the new web roll after pasting is materially relieved.

2. In a pasting device for the purpose described, the combination with a support for a fresh web roll and a movable frame for supporting a web pressing means, of means whereby, when the movable frame is moved into operative position to press the running web against the fresh roll, said fresh roll will be started into a motion of rotation for the purpose described.

3. In a web pasting device for a printing press, the combination with means for supporting a fresh web roll in a position adjacent to the running web and a movable frame carrying means thereon for pressing the web against the roll, said frame being movable into operative position manually, of means connected with said frame for initiating the rotation of the fresh web roll during the motion of the frame from inoperative to operative position.

4. In a web pasting device for a printing machine, the combination with means for supporting a fresh web roll in a position adjacent to the running web, of a movable frame, means carried by said frame for pressing the running web against the fresh web roll, a handle connected with said means for moving the frame into operative position and manipulating the web-pressing means, and means involving a pinion on the spindle of the fresh web roll and a rack connected with the frame for rotating the fresh web roll when the frame moves from operative to inoperative position.

5. In a web splicing device for a printing press, the combination of means for supporting a fresh web roll adjacent to the path of the running web, a pivoted frame, means carried by said frame for pressing the running web against the surface of the fresh web roll, a link pivoted to said frame, said link having a rack thereon, and a pinion on the spindle of the fresh web roll in position to be engaged and operated by said rack as the frame moves toward web pressing position.

6. In a web splicing device for a printing machine, the combination with means for supporting a fresh web roll in a position adjacent the path of the running web, of a frame movable toward the running web, means on the frame for pressing the web against the fresh web roll, and means connected with said frame for starting the fresh web roll into rotation when the frame moves into operative web pressing position.

7. In a web splicing device for a printing machine, the combination with means for supporting a fresh web roll in the position adjacent the path of the running web, of a frame movable toward the running web, means on the frame for pressing the web against the fresh web roll, a link pivoted to said frame, an oscillatory cam lever, means connected with the printing press for oscillating said cam lever continuously, a projection carried by the link and adapted to be moved automatically into the path of the cam lever when the link and frame are moved to operative position, and means operated by the cam lever for starting the fresh web roll into rotation.

8. In a web pasting device for a printing press, the combination with means for supporting a fresh web roll in a position adjacent to the running web, a link connected with the printing press to be reciprocated thereby, a shaft, an arm on the shaft connected with the link, a cam lever on the shaft, whereby the cam lever is oscillated continuously, a movable frame carrying web pressing means, a link connected with the movable frame and having a cam surface, a pin associated with said cam surface to be withdrawn from the path of said cam lever when the frame is moved back and to be projected into the path of the cam lever when the frame is moved forward to operative position, and means connected with said pin for imparting the motion of the cam lever to the fresh web roll to rotate it.

9. In a web splicing device for a printing press, the combination of a movable reel for supporting the fresh web roll, a movable frame adjacent thereto, a web pressing device carried by the movable frame and adapted to press the web against the fresh web roll, a motor for moving said reel to bring the fresh web roll up to web pasting position, means operated by the motion of said frame from inoperative to operative position for starting the motor into operation, a pinion on the spindle of the fresh web roll, and a nonreciprocable rack adapted to be engaged by said pinion during the last mentioned motion of the web roll and reel and thereby rotate the roll on its own axis while it is moving up to pasting position.

10. In a web pasting device, the combination of a rotary reel for supporting web rolls, a motor for rotating the reel, a manually movable frame, a web pressing device on said frame, means on the frame for connecting up the motor circuit with a source of power when the frame is moved from inoperative to web pressing position, whereby the motor will be started, means connected with the motor for rotating the reel, a rack pivoted on a stationary axis, a pinion on the spindle of the reel engaging said rack to rotate the fresh web roll on its own axis while the reel moves up to pasting position, and means connected with said frame for swinging the rack on its pivot into engagement with said pinion when the frame moves up to web pressing position.

11. In a web splicing device, the combination with means for rotatably supporting a fresh web roll and manually operated means which solely by its own motion directly initiates the rotation of said roll so that it will be in rotation when the splice is made to relieve the running web of some of the strain of starting the fresh roll.

12. In a web splicing device, the combination with means for rotatably supporting a fresh web roll and manually operated means movable in one direction for initiating the rotation of said roll by the movement of said means and for rotating it up to a comparatively high speed by the further movement of said means in the same direction.

13. In a web splicing device, the combination of a movable web roll support, an independently movable arm, a rack on the arm, and a pinion on the stud of a web roll on said support in position to engage the rack to rotate the roll on its axis.

14. In a web splicing device, the combination of a movable web roll support, an arm pivoted at a stationary point, a rack on the arm, and a pinion on the stud of a fresh web roll on said

support in position to engage the rack when the support is moved to bring said roll to splicing position for the purpose of rotating the roll by the motion of said support.

15. In a web splicing device, the combination of a web roll support for supporting the running roll and a fresh roll, a pinion fixed with respect to the fresh roll, a movable brush arm, a rack for engaging the pinion, and means whereby the motion of the brush arm to perform the splice will move the rack to rotate the pinion and fresh roll.

16. In a web splicing mechanism for a printing press, the combination of movable means for supporting a fresh web roll, and an independently movable frame provided with means for pressing the running web against the fresh web roll, of means for imparting a momentary motion of rotation to the fresh web roll on its own axis, and connections whereby this last-named means will be started into operation by the motion of the frame to move the web for the purpose of pasting.

17. In a web splicing device, the combination with a movable support for a fresh web roll and a separate movable frame, of a web pressing means supported by said frame, and means connected to move with said frame for rotating the fresh roll, whereby when the movable frame is moved into operative position to perform the splicing operation the fresh roll will be started thereby into a motion of rotation.

18. In a web splicing device, the combination with means for rotatably supporting a fresh web roll and manually driven means for initiating the rotation of said roll, of mechanically operated means to rotate said roll by the manual motion of the last named means at a surface speed between the running and threading speeds of the web.

19. In a web splicing device, the combination of a rotatable web roll support, an oscillatable web pasting arm, a rack controlled by the arm, and a pinion on the stud of a web roll on said support in position to engage the rack to rotate the roll on its axis.

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