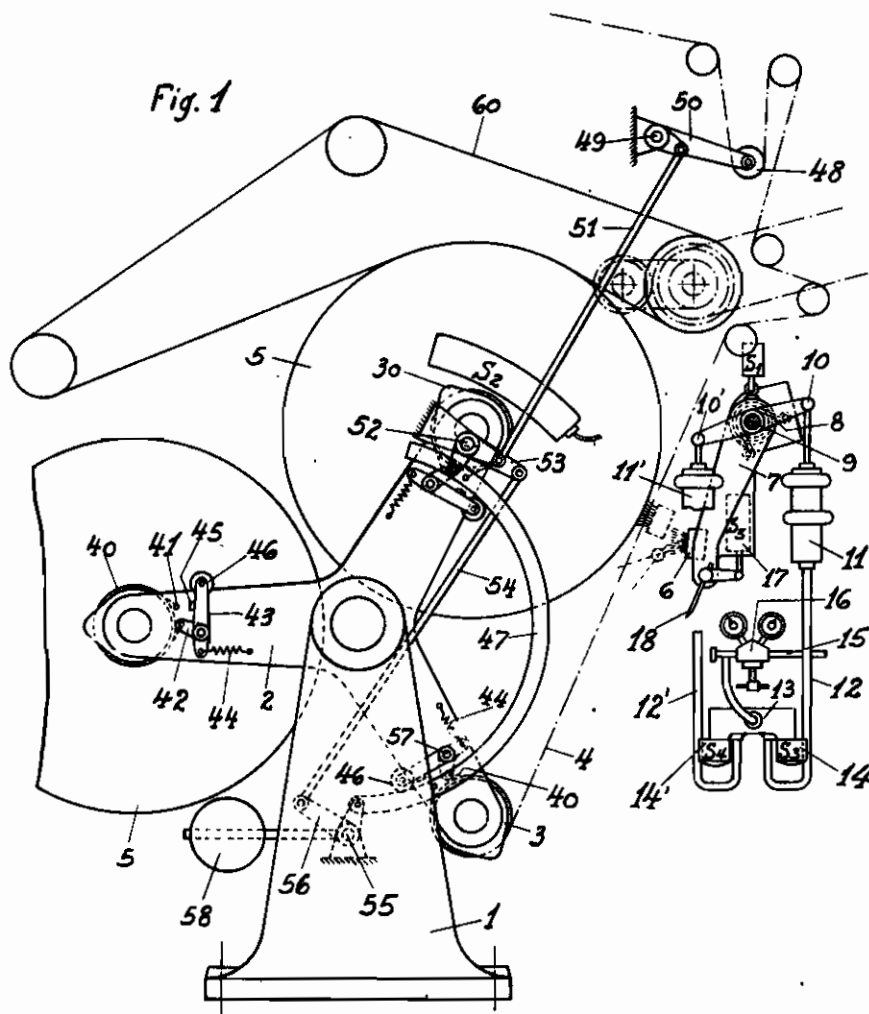


PUBLISHED
MAY 25, 1943.
BY A. P. C.

P. DIETRICH
JOINING PAPER REELS
Filed May 24, 1940

Serial No.
337,038
3 Sheets-Sheet 1

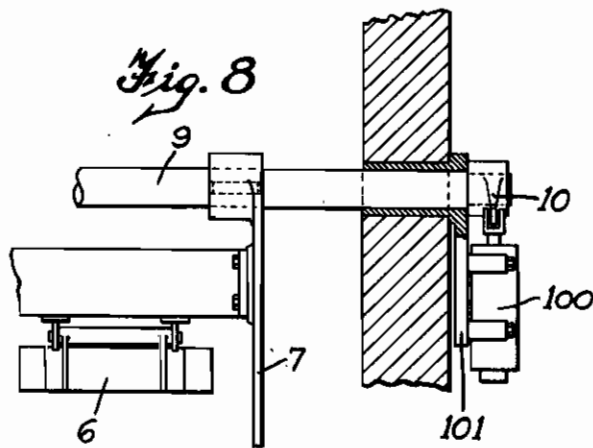
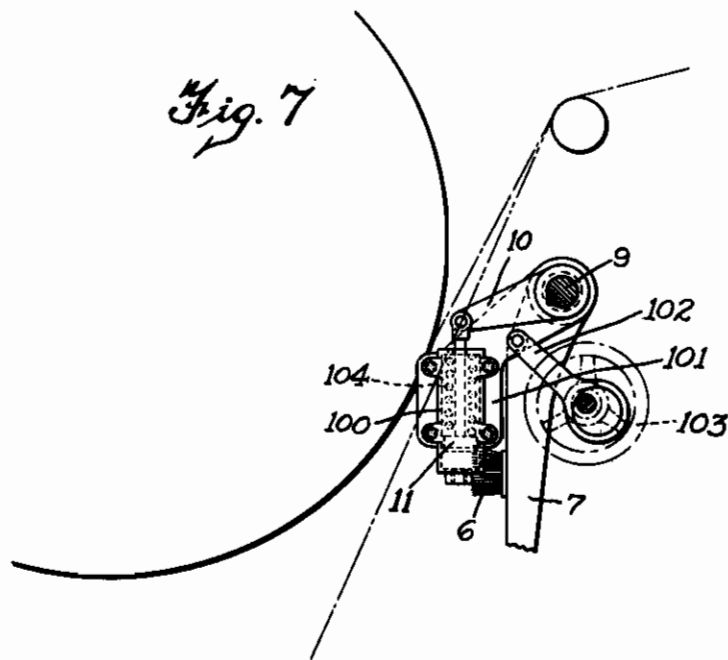


Inventor
Paul Dietrich
By Marechal & Nor
attorneys

PUBLISHED
MAY 25, 1943.
BY A. P. C.

P. DIETRICH
JOINING PAPER REELS
Filed May 24, 1940

Serial No.
337,038
3 Sheets-Sheet 3



Inventor

Paul Dietrich

By

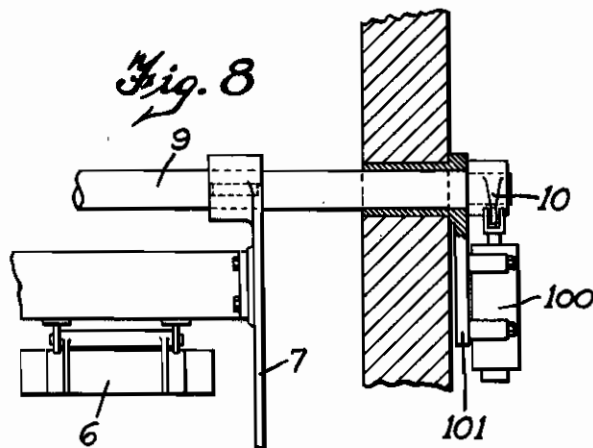
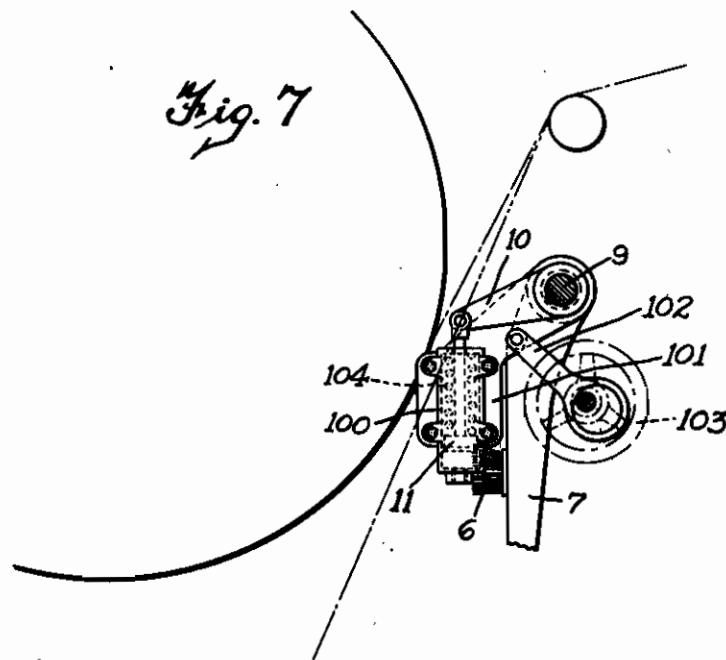
Marchal & Noi

Attorneys

PUBLISHED
MAY 25, 1943.
BY A. P. C.

P. DIETRICH
JOINING PAPER REELS
Filed May 24, 1940

Serial No.
337,038
3 Sheets-Sheet 3



Inventor

Paul Dietrich

By

Marchal & Noz

Attorneys

ALIEN PROPERTY CUSTODIAN

JOINING PAPER REELS

Paul Dietrich, Augsburg, Germany; vested in the
Allen Property Custodian

Application filed May 24, 1940

This invention relates to a device for joining paper reels by sticking a new reel to a running-down web, the new reel, disposed in a rotary frame, being brought up to the speed of the running-down web and, by turning the frame, into a position at which the sticking operation is performed. This is done by means of a pressure applying brush at the end of a lever actuated by a piston or pistons which are moved by pneumatic or hydraulic pressure controlled by an electromagnetically operated piston slide-valve or a valve system.

The present invention constitutes an improvement of a device of the type outlined above and takes into consideration that when the running-down reel is swung out of operating and into sticking position for the new reel the brush must be moved out of the range of the running-down reel and later on brought again as closely as possible to the running-down web. This is necessary, since in view of a web speed of approximately 6-8 m. per second exact operation of the sticking means is insured only by rapid action. As the release of the sticking operation depends upon the position of the joining point on the new reel, even tenths of a second will matter and the brush must therefore be in direct contact with the running-down web prior to sticking. Such an arrangement is suitable also because it reduces fluttering of the running web and thereby insures sticking.

In a known construction of this class the cylinder for actuating the lever for the brush is fixed to the machine frame. To bring about the to and fro motion of the brush preceding the sticking operation the shaft for the lever is moved separately with the result that the piston, particularly during application of the brush to the running-down web, is displaced to such an extent that an empty space is produced on one side of the piston and had to be filled with air or liquid during the subsequent actuation of the sticking means. Experiments have shown, however, that this involves a loss of time great enough to prevent operation of the sticking means at the requisite speed.

According to the present invention, these drawbacks are eliminated by mounting the cylinder on an arm that is movable about the shaft for the lever supporting the brush. At the actuation of this arm, the motion thereof will be transmitted through the piston, piston rod and lever to the shaft for the latter and the brush applied to the web without relative displacement

of the piston and cylinder and without the formation of a dead space.

In a particularly simple constructional embodiment of the invention only a single cylinder having a piston working against spring action is used. The movable arm on which the cylinder is mounted may be actuated at will, preferably by means of a pawl-operated handwheel and eccentric.

The invention is illustrated by way of example in the accompanying drawing, in which

Figures 1 to 6 show a device of the known type and

Figs. 7 and 8 are, respectively, a front and side view, partly in section, of the features of the invention.

The three-reel-star 2 rests rotatably in bearings of the floor stand 1. It carries the running-down reel 3 with the running-down web 4 and the new reel 5 which is to be stuck to the running-down web 4. After applying the adhesive, sticking is effected by the brush 6 at the end of the lever 7. This lever 7 will be moved by torsional springs 8 on a shaft 9, which by means of pistons 11 or 11' acting on levers 10 or 10' may be twisted either way. The pistons 11 or 11' are actuated by compressed air which after release by a piston valve or a valve system 13 enters into the one or the other line of piping. Control is effected by either the magnet 14 or 14'. The air is supplied through a pressure reducing valve 16 and a piping 15. Pressure in the valve 16 may be adjusted at will. The speed at which the lever 7 and together therewith the brush 6 is swung into operating position may be regulated at will by means of a throttling valve or valves in the air pipes. On the lever 7 a magnet 17 also is placed which actuates the knife 18 for severing the running-down web.

Together with the paper reels a cam 30 rotates which operates directly together with a counter cam 31 (see Figs. 2 and 3). The cam 31 is supported in three places by springs 32 and is provided with silver contacts 33 in two places which operate together with corresponding counter contacts also elastically supported by springs 35.

The electric circuit according to Figs. 1 to 6 may for instance operate as follows:

While the old reel runs down, that is before the reel star is put in position where sticking may take place, the connection prepared between contact S2 and the electromagnetic control valve S4 is interrupted by a push button, not shown. There is now no connection between the contact

S2 and the lifting magnet S5 which operates the severing knife 16.

As soon as the push button is pressed and the cam 30 on the paper reel cone closes the contact S2, the electromagnetic control valve S4 is energized and opens the compressed air pipe and the way to the piston 11'. This causes the lever 7 with the brush 6 to swing towards the web of the running-down reel which will thereby be stuck onto the new reel. Simultaneously, the end switch S1 breaks the connection between the contacts S2 and the electromagnetic control valve S4 and prepares a connection between the contact S2 and the electromagnetic control valve S3, and also between the contact S2 and the electric lifting magnet S5, which latter connection is, however, still interrupted by the contact S2.

On the next revolution of the cam 30 on the reel cone the contact S2 will be closed again. Now the electromagnetic control valve S3 as well as the electric lifting magnet S5 will be energized. Between S2 and S3, and also between S2 and S5, a time relay is interposed. The effect of it is that first the lifting magnet S5 will actuate the knife which severs the running-down web and only then the electromagnetic control valve S3 will open the compressed air piping leading to the piston 11 which moves the lever 7 back again to rest.

The return swing of the lever 7 operates the end switch S1, and the connection between S2 and S3 as well as that between S2 and S5 is thereby broken. Simultaneously, the previous connection between S2 and S4 is prepared so that conditions for another sticking operation are restored again.

Fig. 1 shows, moreover, that the reel shafts are provided with brake bands 40 which at 41 are fastened and at 42 attached to a two-armed lever 43. A spring 44 holds the two-armed lever 43 with sufficient force against a stop 45 to balance the brake effect. A roller 46 at the one end of the two-armed lever 43 is within reach of the circularly curved lever 47 when the reel is in the normal running-down position, without any special braking effect taking place, since the paper reel in this position is under the influence of the band pendulum 60. In the no-load position, however, as in the case of reel 3 a brake effect may be caused by the lever 47, since the oscillating roller 48 is influenced by the tension of the web. If the tension relaxes the oscillating roller will sink a little, whereby through an intermediate two-armed lever 50 in bearings 49 a rod 51 is moved downward. This motion is transmitted to the rod 54 by means of the two-armed lever 53 in bearings 52, whereby the two-armed lever 56 in bearings 55 is caused to swing counter-clockwise. By the motion of the lever 53 as well as that of the lever 56 the curved lever 47 will be moved towards the middle shaft of the floor stand 1. The roller 46 will thereby be swung about the fast center of

motion 57 and the brake band will be tightened. The reversed motion occurs when the tension of the web increases and the oscillating roller 48 is thereby raised. A counterweight 58 serves to balance the lever.

The band pendulum is influenced by the paper reel as well as the roller of the printing mechanism. An oscillating roller 48 (Fig. 6) is influenced by the tension of the web 4 and adjusts by means of a toothed wheel 63, a rack 64 and a lever 55 a mercury tilting switch 67, the lever 65 oscillating about the center of motion supposed at the time to be at rest. It drives an electromotor 62 (Fig. 4) which adjusts the rack 68 (Fig. 6) whereby a gear without steps is adjusted which regulates uniformity of motion of the band pendulum 60 and the roller until the tension of the web is compensated again. To prevent excessive regulation the rack 68 like the stop 66 will be adjusted in the sense that the lever 65 will swing about the point 70 as the now supposed fast center of motion, so that the mercury tilting switch 67 will break the circuit driving the motor before the oscillating roller 48 may get into normal position. In this manner intermittent adjustment is attained which prevents oscillations.

Between the printing machine roller and the paper reel a free wheel 71 (Figs. 4 and 5) is interposed which is constructed as follows: The rollers 72 will be pressed into the wedge-shaped spaces between the outer wheel 73 and the inner wheel 74 as long as the drive of the paper reel, which normally overruns a little the speed of the printing machine rollers, is effective. As soon, however, as the running-down reel 3 is rocked out of reach of the band pendulum 60 (Fig. 1), this drive fails as the paper reel 5 which is now situated under the band pendulum 60 is still at rest. The rollers 72 will be held back by the outer wheel 73, so that the wheel 74 which is coupled to the printing machine roller may freely rotate. The wheels 74 and 73 are connected only by a slip coupling 75. This causes the presently resting paper reel 5 to attain slowly the speed of the running-down reel 3, whereupon the sticking operation may be started anew in the manner described.

Referring to Figs. 7 and 8, the invention resides in the following: The brush 6 is arranged on a lever 7 connected with the shaft 9 which through the lever 10 keyed thereto is moved by the piston 11 against the action of the spring 184. According to the invention, the cylinder 100 is mounted on an arm 101 loosely rockable about the shaft 9 and moved by a lever 102 eccentrically connected with a handwheel 103 controllable by a pawl. By turning the handwheel 103 the arm 101 and thereby the shaft 9 are adjusted without causing any variation in the position of the piston 11 in the cylinder 100.

PAUL DIETRICH.