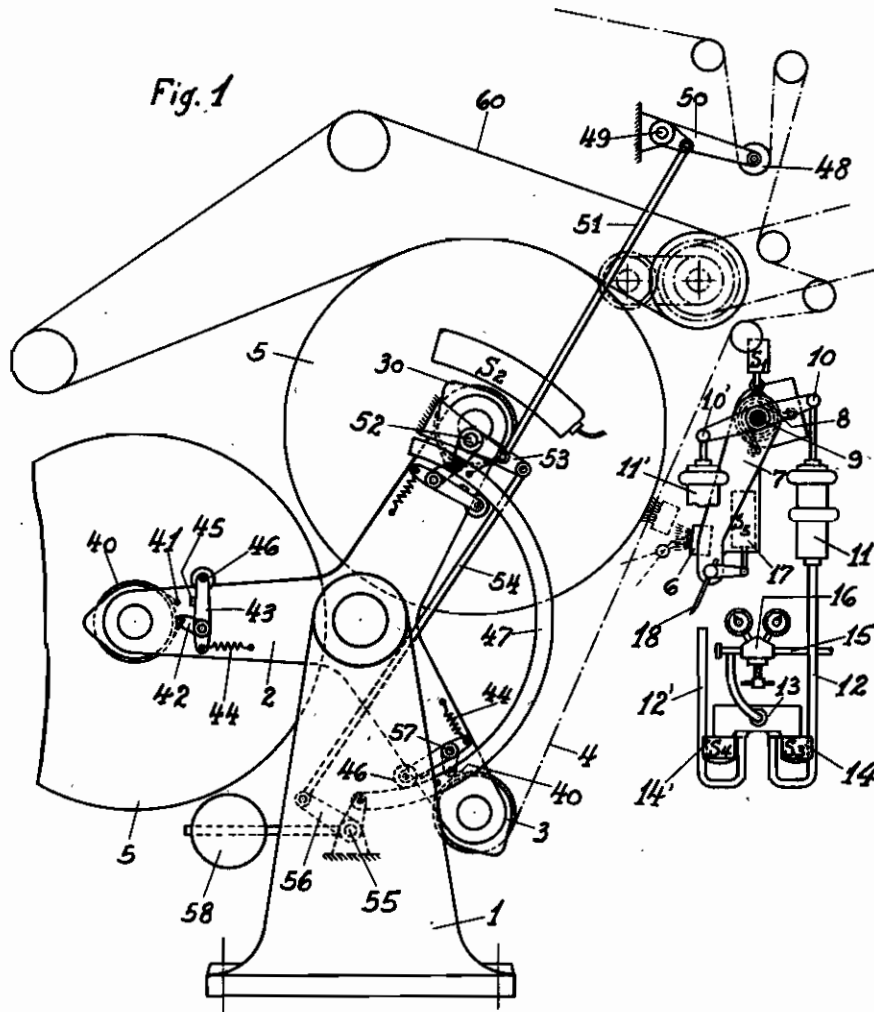


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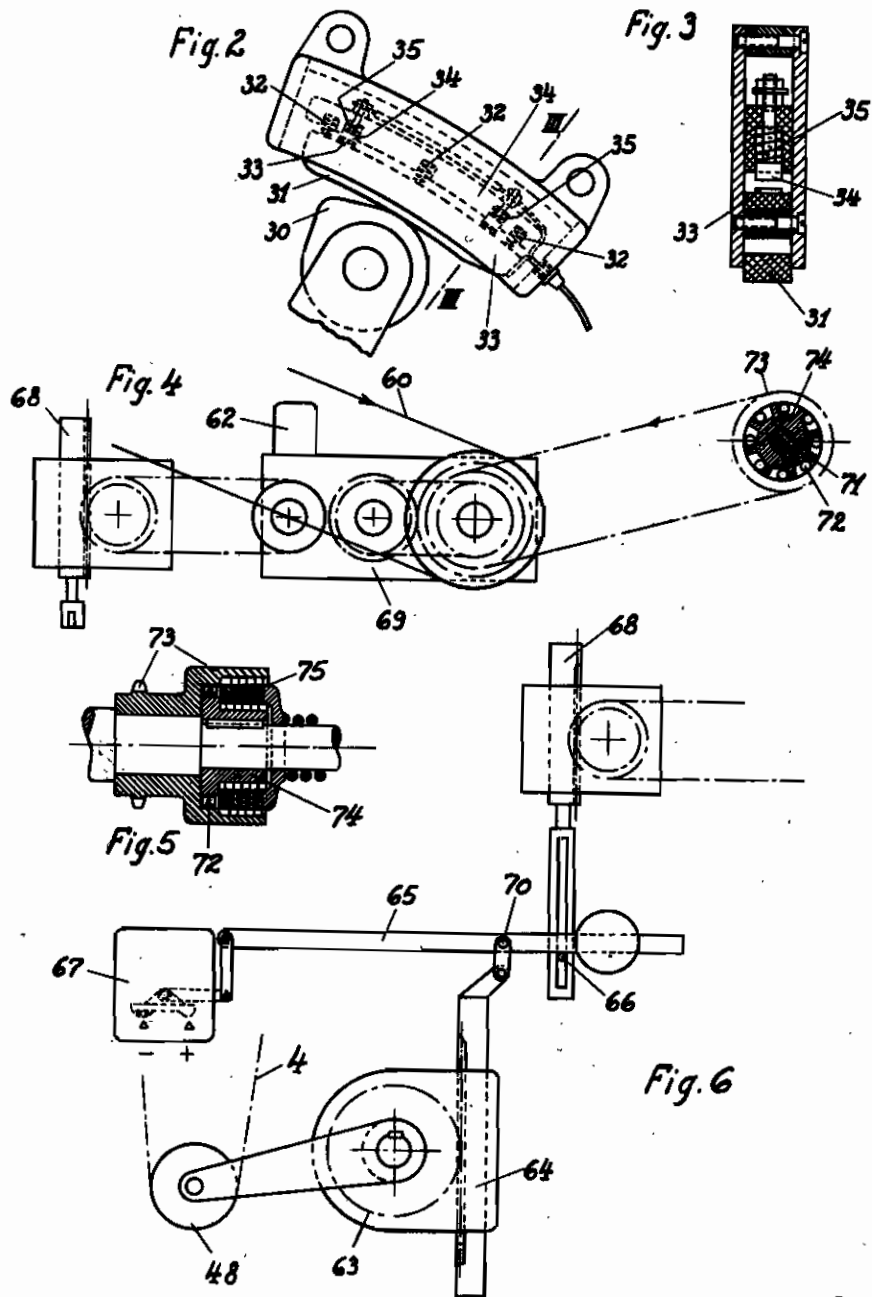


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ALIEN PROPERTY CUSTODIAN

JOINING PAPER REELS

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the Alien Property Custodian

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The invention relates to a device for sticking the rear portion of a running-down web to a new reel, in which the new reel is carried in a rotatable frame and caused to revolve with the speed of the running-down web, and by a turn of the carrier frame is brought into position for sticking, adhesion being affected by the pressure of a brush. Devices of this kind are preferably used in rotary printing machines. In known devices of this description the brush is actuated by means of rods. Since the sticking is to be done very quickly, vigorous shocks consequently occur in known devices of this sort which jeopardize smooth working; they lack a sensitive and still sufficiently safe means of actuation.

According to the invention such a means is provided in the following manner. The brush carrying lever is actuated by one or more pistons which stand under the influence of some non-mechanical pressure, such as pneumatic or hydraulic pressure controlled, agreeably to the purpose, by an electromagnetically operated piston valve or system of valves. In effecting this by pneumatic or hydraulic pressure it offers no difficulties to regulate the duration of the operation by more or less sharp throttling. In order to prevent the brush being pressed too vigorously against the web, in a further developed form of the invention, the brush carrying lever is rendered yielding, for instance by means of an intermediately placed torsional spring, this spring acting in a manner as an organ of safety. Moreover the elasticity of the spring and with it the pressure of the brush may be regulated.

Since it is possible in this invention to release the impulses by means of the electric current, in itself a simple and therefore advantageous way, and no shocks occur which are usual with the operations of these organs, it is also feasible to use as simply the known cam gear for controlling the electric current to release the impulse for the brush to operate. The use of the cam gear is necessary because the adhesive is spread over the larger part of the circumference of the reel. Were the brush accidentally to press the running-down web against the new reel at the instant when the running-down web could touch only the rear edge of the area covered with the adhesive, the not used adhesive would be sure to cause an obstruction further along which in turn would cause the web to break. This may be avoided by the cam which of course has to have a definite position relative to the adhesive area. The cam gear also controls the motions of the knife for cutting off the tail end of the old web

after the new reel has been stuck to the main portion.

In known cam gears which serve such purposes the contacting member is actuated by a rotating cam member and rods. There being considerable masses to be quickly accelerated and retarded, these arrangements were not successful. According to the invention this defect is avoided in the following manner. The cam gear consists of a member which is controlled directly by the rotating member and provided with an elastic bearing and also having a multiplicity of contacting areas which operate with counter contacts, also in elastic bearings. In this manner a contact is provided which will bear hard usage.

Also means have to be provided which after the brush has been put in operation, will prevent the afore-mentioned cam gear from actuating brush and knife a second time when the contacts touch anew but which will allow both these organs enough time to operate effectually. To this end, according to the invention, the electric circuit for operating the brush and knife which is closed arbitrarily and the cam gear dependant on the position where the sticking will take place is influenced by time relays.

It is moreover necessary that the running-down reel be subjected to a brake controlled by the tension of the web as soon as in the carrier frame it is moved out of reach of the usual reel brake. To this end, according to the invention, the reel cones are fitted with band brakes, the effect of which may be arrested by a spring acting upon the brake lever. In the no-load position the reel axle with its reel swung inside the turning frame will be situated under a lever which is shaped, agreeably to the purpose, like the segment of a circle and which is moved by an oscillating roller influenced by the tension of the web. This lever consequently operates by the roller upon the brake lever proper whereby the band brake upon the axle of the reel will be tightened more or less.

When the web normally rolls off the reel, the reel is, agreeably to the purpose, influenced by a band pendulum and an oscillating roller dependent on the tension of the web, which roller by means of a control motor and a step-less gear ensures uniform speed of printing machine, rollers and paper reel. Normally the speed of the reel will exceed that of the printing machine rollers and the coupling of the roller speed will act brakelike. Before the new paper reel may be stuck to the running-down web, the new paper reel which at the start is not in motion must be

made to acquire the speed of the running-down web. To this end, according to the invention, a free wheel of known construction is provided between roller and reel which in the event of the reel drive falling which is normally faster than the roller speed, the band pendulum may no longer be coupled to the roller drive. Hence the speed of the band pendulum may adapt itself to that of the reel which at first is nil. Now in order to make the new reel attain the speed of the running-down web, the band pendulum will be driven from the roller only by a slip coupling.

The drawing shows a preferable form of the object of the invention.

Fig. 1 is a diagrammatic total view;

Figs. 2 and 3 show the cam gear for the control of the electric circuit;

Figs. 4 and 6 the means for regulating the speed of the band pendulum, and

Fig. 5 the slide coupling and the free wheel pertaining thereto.

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 a 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 the piping 15. Pressure in the pressure reducing valve may be adjusted at will. The speed with which the lever 7 and together therewith the brush 6 is swung into operating position, may be regulated at will by means of throttling 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 Fig. 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 which are 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 18.

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 contact S2 and the electromagnetic control valve S4 and prepares a connection between the contact S2 and the electro-magnetic control valve

S3, and also between the contact S2 and the electric lifting magnet S5, which latter connection however is still interrupted by the contact S2.

On the next revolution of the cam 30 on the reel cone the contact S2 will again be closed. Now the electro-magnetic 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 which is that first the lifting magnet S5 will actuate the knife which severs the running-down web and only then the electro-magnetic 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 again restored.

The 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 brake effect taking place; since the paper reel in this position stands 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 contrary-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 takes place when the tension of the web increases and the oscillating roller 48 is thereby raised. A counter-weight 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 (see Fig. 6) is influenced by the tension of the web 4 and adjusts by means of a toothed wheel 63 and a rack 64 and also a lever 65 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 (see Fig. 4) which adjusts the rack 68 (see 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 again compensated. To prevent excessive regulation the rack 68 like the stop 68 will be adjusted in the sense that the lever 65 will swing about the point 70 as the now supposed to be 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 the 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 (see 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 (see Fig. 1), this drive falls 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 in the manner described be started anew.

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