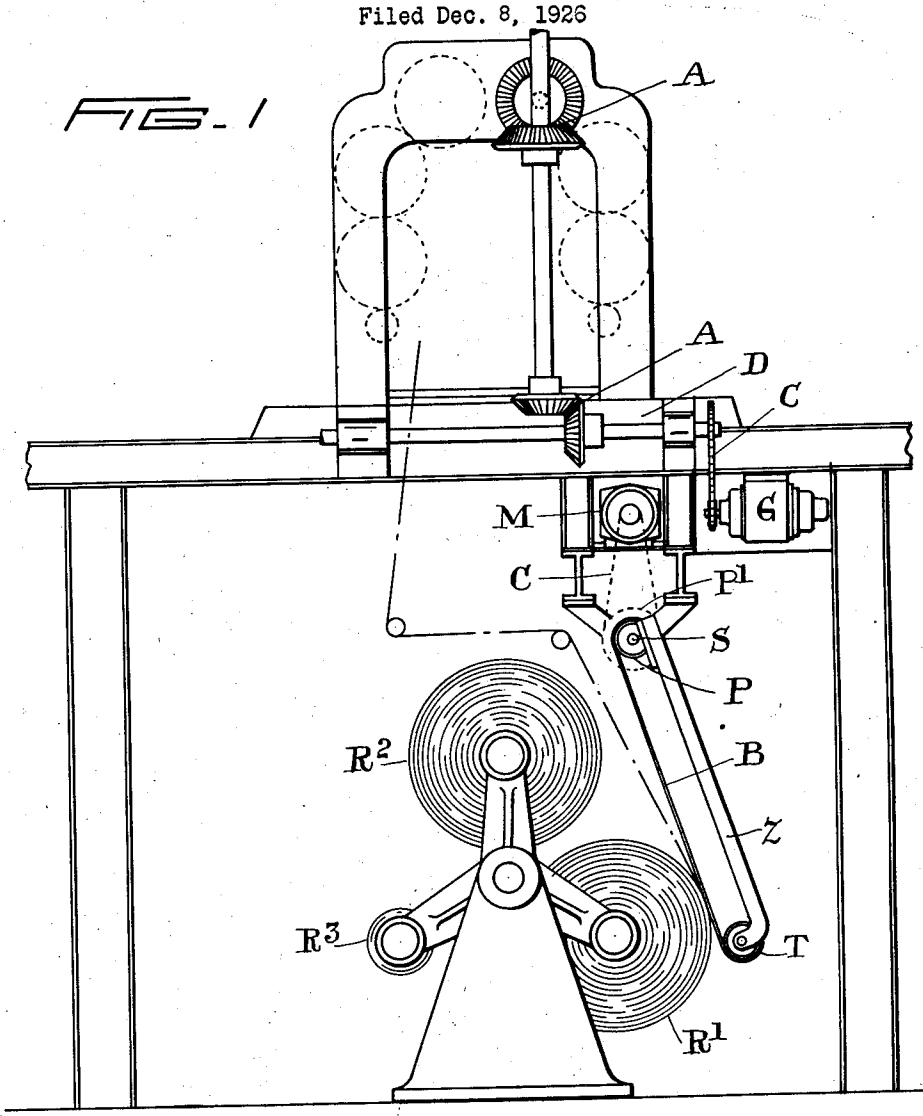
June 5, 1928. 1,672,320

H. V. JAMES

BRAKING MECHANISM FOR PRINTING MACHINES

Filed Dec. 8, 1926

FIG. 1



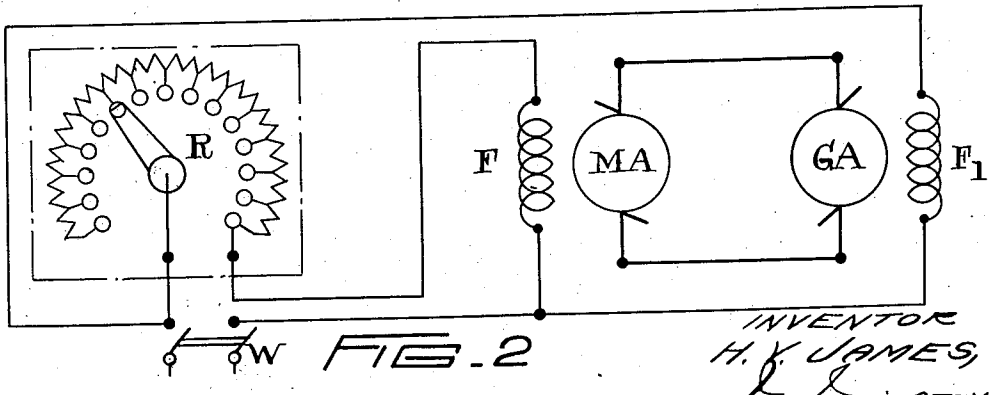


FIG. 2

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UNITED STATES PATENT OFFICE.

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BRAKING MECHANISM FOR PRINTING MACHINES.

Application filed December 8, 1926, Serial No. 153,385, and in Great Britain October 15, 1926.

My invention relates to reel-fed printing machines and is particularly designed for use with magazine roll stands such as are now in common use for the purpose of feeding paper to rotary printing presses, the ready renewal of reels, and to effect paste-up and web splice between the spent reel and replacement reel without stoppage of the machine.

In these machines the rolls of paper are usually carried and rotated on free spindles which enter the centric hollow core on which the paper is reeled, which system obviates the necessity of spindling-up.

For the purposes of assisting normal reel start-up, web tension feed to the press, braking at slow-down or stop press, and rotation of the new reel at splice-up, belts are used which bear on the periphery of the reel, the belts usually being positively mechanically coupled to and driven in combination with the press in such ratio that the speed of the belts in feet per minute is slightly less than the corresponding speed at which the paper web is drawn into the printing machine, usually about 6 per cent; the difference in speed developing a frictional brake on the web.

The mechanical parts necessary for directly gearing the belt driving pulleys to the press are extensive and costly, and of such type that a positive gear ratio only is practicable, whereas a variable ratio is very necessary for the purpose of a corresponding speed variation between the paper web and belts, to prevent unnecessary fluffing up of the printing plates, a more effective braking range and the better pasting-up to the new reel.

The object of my invention is to provide means for the driving of the reel belts synchronously with the printing machine but variable in speed ratio without the use of any mechanical coupling or driving means between the belts and printing press or its driving means.

My invention may be described as consisting in the combination of two electro-dynamic machines one of which I will refer to as a dynamo and the other as a motor. The dynamo is positively geared to the printing press or its driving means and is arranged to feed and drive a motor coupled to the reel braking belts. The armature and field circuits of the electro-dynamic machines are connected together in such a manner that the speed of one will always correspond in ratio to that of the other, regulating means being provided whereby the said ration may be varied. Such means may be arranged in the field circuit of either or both machines. Further, the armatures may be arranged in parallel and in separately and independently excited fields having the regulating means.

The motor is coupled to the reel braking belts in such a manner that the rise or fall in speed of the dynamo, and likewise its electro-motive force, will effect a similar rise or fall in speed of the motor, and act as a dynamic brake on the latter to prevent overrun as the printing press and dynamo are slowed down or quickly brought to rest.

At normal reel start-up or at rotation of a new reel at splice-up, the belts may be made to bear on the periphery of the feed roll and drive same for the purpose of effecting or assisting either of the above operations.

The electro-dynamic machines referred to as dynamo and motor respectively will actually be motor and dynamo in various phases of their operation; they are therefore styled dynamo and motor respectively for the purpose of ready distinction only. When the press is driven by a motor of suitable characteristic, the armature of same may be used instead of an independent generator to produce the same results, therefore the term dynamo used in this specification in respect of an electro-dynamic machine for feeding the motor coupled to the braking belts, may also be construed to mean a motor having the suitable characteristics and used for driving the press.

I will now describe my invention with reference to the accompanying drawing, wherein:

Fig. 1 shows by way of example the application of the invention to a printing press, the dynamo G being driven by the mechanical connection generally indicated by A, and

Fig. 2 shows a suitable circuit arrangement for controlling the field energizing current of the motor M whereby the lag of the belt B may be varied as desired.

D is a shaft positively geared by the members A to the printing machine and its driving means. G is a dynamo with positive driving means C by shaft D.

M is the electric motor with positive chain driving means C to shaft S to which are

fitted and keyed pulleys P^1 driving the web braking belts B, usually in multiple, stretched between pulleys P and T, in multiple, in the usual frame Z.

Reel R^1 is that being unwound and feeding the press braked by belts B. R^2 is the next replacement reel and R^3 the spent reel stump about to be replaced.

W is a switch in an independent electricity supply service energizing the dynamo and motor field circuits F, F^1 respectively, with multiple way regulator R in the circuit of F, GA and MA being dynamo and motor armatures respectively and connected in independent parallel, both of which are wound and geared in such ratio that at a given press speed, an electro-motive force is developed by the dynamo armature GA which will energize motor armature MA in corresponding speed and likewise the driven belts B and cause same to increase or decrease speed at all times in synchronism with the printing press, variable as to ratio by means of the field regulator R in the circuit of the motor M.

When the press driving means is slowed down and likewise the dynamo armature GA, overrun on armature MA, is prevented by the fall in effective electro-motive force generated by armature GA and the automatic set-up of an electro-dynamic braking effect on armature MA through armature GA.

Whilst I have described my invention in relation to magazine roll stands it must be understood that it applies also to single roll stands and that it can be carried out in any suitable manner within the scope of the following claims.

What I claim is:

1. A printing machine having a magazine roll fed product in which a dynamo is driven from the machine and a motor is driven from the dynamo said motor driving a braking band contacting with the web passing from the roll to the machine.

2. A printing machine having a magazine roll fed product in which a dynamo is driven from the machine and a motor is driven from the dynamo said motor driving a braking band contacting with the web passing from the roll to the machine and in which a variable resistance is employed to vary the braking effect of the band on the web.

3. In a printing machine having roll fed product such as a paper web, the combination of two electro-dynamic machines, one geared to the printing machine and the other coupled to a belt bearing on the periphery of the feed roll for the purpose of driving or braking same, the electro-dynamic machines having their armatures and field circuits connected in such a manner that the machine geared to the press constantly tends to maintain, and during normal working of the press does maintain, through the intermediary of the machine, coupled to the belt, the speed of the said belt at a smaller rate than that at which the web passes to the press, and means for varying the speed ratio of the one machine to the other.

4. In a printing machine having roll fed product such as a paper web, the combination of two electro-dynamic machines, one geared to the printing machine and the other coupled to a belt bearing on the periphery of the feed roll for the purpose of driving same, the armatures of the electro-dynamic machines being connected in series and arranged in separately and independently excited fields and so that the machine geared to the press constantly tends to maintain, and during normal working of the press does maintain, through the intermediary of the machine coupled to the belt, the speed of the said belt at a smaller figure than that at which the web passes to the press, and means for varying the speed ratio of the one machine to the other.

In testimony whereof I affix my signature.

HENRY VINCENT JAMES.