United States Patent [19]

Smith

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[54] **PLATEN BRAKE AND PAPER BLOUSING ELIMINATOR**

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[73] Assignee: **International Business Machines Corporation,** Armonk, N.Y.

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[52] **U.S. Cl.** ..... **197/133 R,** 226/59, 226/148

[51] **Int. Cl.** **B41j 15/00**

[58] **Field of Search** ..... 197/126 R, 127 R, 128, 197/133 R, 133 T, 133 F, 133 A, 133 P, 144, 145, 146, 147, 149, 138 R, 138 A; 226/59, 148, 195; 188/82.8, 82.84

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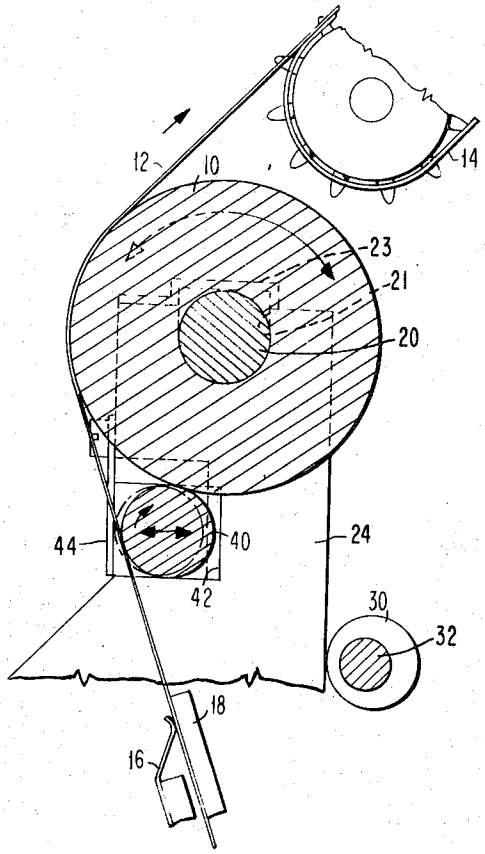
Attorney, Agent, or Firm—Francis V. Giolma

[57] **ABSTRACT**

A rod is rotatably and slidably mounted adjacent a rotatable platen. A continuous form fed past the platen engages both the platen and the rod causing the rod to slide toward and contact the platen. The form tends to rotate the platen clockwise while the rod being rotated clockwise by the form engages and tends to rotate the platen counterclockwise causing it to stop concurrent with cessation of form feed, particularly during high speed skip operations.

5 Claims, 2 Drawing Figures



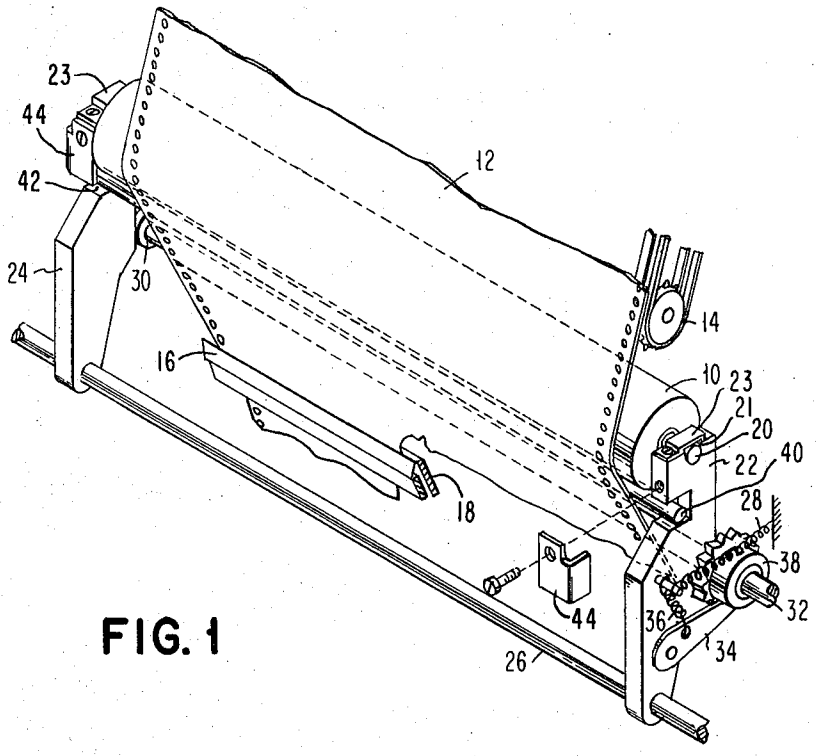

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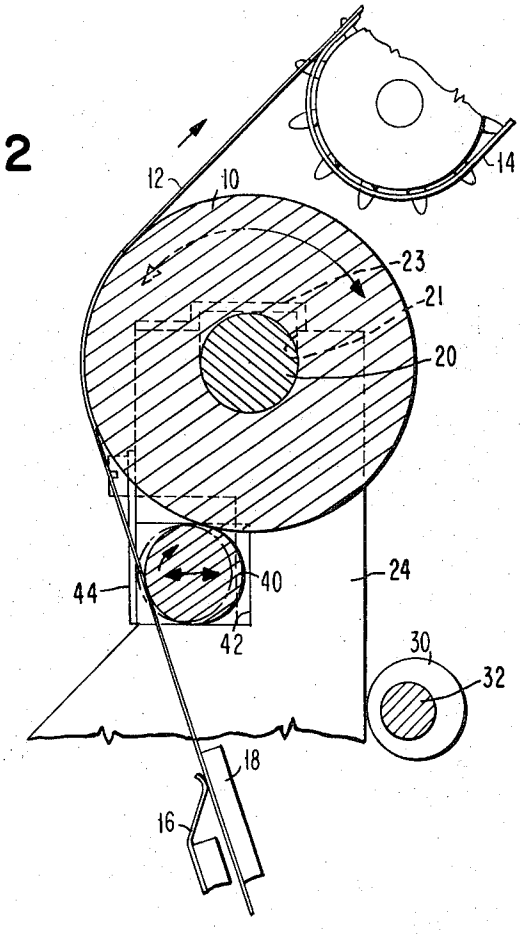
FIG. 1

FIG. 2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PLATEN BRAKE AND PAPER BLOUSING ELIMINATOR

FIELD OF THE INVENTION

The invention relates generally to printers and it has reference in particular to braking of a rotatable platen in a continuous form printer.

DESCRIPTION OF THE PRIOR ART

Spring members bearing against a form in the region of a platen have been used for braking the form in continuous form cutters and the like, as shown in U. S. Pat. No. 1,665,444, entitled "Paper Feed and Cutting Mechanism," which issued Apr. 10, 1928, to S. E. Chapman.

SUMMARY OF THE INVENTION

Generally stated, it is an object of this invention to provide a simple and effective platen brake for a high speed printer.

More specifically, it is an object of the invention to provide for using a form actuated member engaging a rotatable platen to prevent overrun of the platen on high speed form skips.

Another object of the invention is to provide for preventing blousing of a form in a high speed skip operation by using a movable brake rod which is forced into engagement with a rotatable platen by the form.

Yet another object of the invention is to provide for having a continuous form slide a rotatable and slidable brake member into engagement with a rotatable platen which rotates with movement of the form for braking rotation of the platen.

The foregoing and other objects, features and advantages of the invention will be apparent from the following more detailed description of a preferred embodiment of the invention, as shown in the accompanying drawing.

DESCRIPTION OF THE DRAWING

In the drawing:

FIG. **1** is a schematic isometric view of a platen and brake construction for a printer embodying the invention in a preferred form; and

FIG. **2** is an enlarged partial cross-sectional view in elevation of the embodiment shown in FIG. **1**.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to both FIGS. **1** and **2**, the reference number **10** denotes generally a platen of hard rubber, plastic or the like designed to be positioned behind a continuous Form **12**, which is fed by means of a Tractor **14**, for use with a printing mechanism such as the wire matrix print head shown in co-pending application Ser. No. 68,278 of P. A. Brumbaugh et al, entitled "Wire Matrix Print Head," filed August 31, 1970 now Pat. No. 3,672,482 issued June 27, 1972. A brake device represented by the Leaf Spring **16**, which is positioned on one side of the Document **12** and presses against a Support **18** on the other side, may be used to maintain tension in the Form or Document **12**.

In order to provide a new print surface for each line of print, the Platen **10** is rotatably supported by means of a Shaft **20**, which is mounted in Bearing Slots **21** in Support Arms **22** and **24** at opposite ends of the Platen **10**, where it is retained by Caps **23**. The Arms **22** and **24** may be pivotally mounted by means of a Shaft **26** and biased by means of Springs **28** against Cams **30** secured on a rotatable Shaft **32**. The Shaft **32** may be rotated to rotate the Cams **30** and pivot the Arms **22** and **24** toward and away from the print mechanism to adjust for the maximum printing conditions with different thicknesses of Form **12**. Means such as the Pawl **34**, which is biased by means of a Spring **36** against a Star or Detent Wheel **38** on the Shaft **32**, may be used to maintain the desired position of the Cams **30**.

In order to prevent overrun of the Platen **10**, which is rotated by frictional engagement with the Form **12**, as it advances, and has a tendency to continue rotating after the Form **12** stops, brake means such as the Brake Rod **40** may be provided. The Brake Rod **40** may be rotatably and slidably supported by being positioned in Slots **42** in the Arms **22** and **24**. Clips **44** secured to the Arms **22** and **24** retain the Rod **40** in the Slots **42**. The Slots **42** are so positioned relative to the Platen **10** that the Form **12** engages the Brake Rod **40** as well as the Platen **10**, causing the Brake Rod **40** and the Platen **10** to rotate in a clockwise direction as the Form **12** advances. The Form **12** also tends to move the Brake Rod **40** horizontally to the right, as shown in FIG. **2**, causing it to engage with and wedge against the Platen **10**. Frictional engagement between the Brake Rod **40** and the Platen **10** tends to cause the Platen **10** to rotate in a counterclockwise direction, which is opposite to the direction of rotation imparted to it by the Form **12**. The result is that the position of the Platen **10** will change for each line of print as single line spacing occurs. In the case of high speed skips where the Form **12** advances several lines or more, the Rod **40** actually functions as a brake during advance of the Form **12**, wedging against the Platen **10** and minimizing rotation of the Platen **10** to the extent that it stops turning after a relatively short advance of the Form **12**, even though the Form **12** continues to advance, and is always stopped concurrent with or prior to cessation of movement of the Form **12**. This prevents overrun of the Platen **10** and the creation of a blousing condition and/or slack condition in the Forms **12** which previously occurred with a free rotating platen, when the platen continued to rotate after the Paper Tractor **14** stopped, tending to drag the form with it.

From the above description and the accompanying drawing it will be seen that there is provided a simple platen brake and paper blousing eliminator which eliminates the problem of non-parallel printing and overlap printing between the first two lines of a print following a high speed skipping operation. The platen brake of the subject invention inhibits overrunning of the free rotating Platen **10**, which is purposely made rotatable to provide a new printing surface for each line or print so as to minimize possibility of platen damage from the printing element. Movement of Forms **12** through the machine under tension and against the Platen **10** causes the Platen **10** to turn satisfactorily during normal spacing conditions. In a case of high speed skips of several inches the platen brake prevents rotation of the Platen **10** after the paper transport stops and prevents the tendency of the Platen **10** to drag the Form **12** with it, thus solving the problem.

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art

that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. The combination with means for advancing a continuous form positioned on one side of a rotatable platen engaging and rotated by said continuous form to provide a backing for printing on the continuous form, said rotatable platen having a cylindrical periphery and coaxial ends, and means positioned on the other side of the rotatable platen to provide a drag and produce a tension in said continuous form, with said rotatable platen being so positioned as to provide a change in the direction of the path of said continuous form, between said means for advancing and said means for providing a drag, of

rotatable brake means slidably disposed away from and toward said rotatable platen to engage said rotatable platen at said periphery, said rotatable brake means being so positioned relative to said rotatable platen and said continuous form that the continuous form engages said rotatable brake means and said rotatable platen, rotating said rotatable brake means and forcing said rotatable brake means into engagement with said rotatable platen so as to tend to rotate said rotatable platen in the opposite direction to that in which said rotatable platen is rotated by said continuous form.

2. The invention as defined in claim 1 characterized by said rotatable platen being rotatably supported by spaced support means which support the ends of said rotatable platen, and said brake means comprising a cylindrical rotatable brake rod slidably disposed in slots having inner and outer ends in said support means to interfere with said rotatable platen.

3. The invention as defined in claim 2 characterized by said slots being off center and non-tangential with respect to said rotatable platen with said brake rod being substantially clear of said rotatable platen at the outer ends of said slots, and in engagement with said rotatable platen adjacent the inner ends of said slots.

4. The invention as defined in claim 3 characterized that said slots are horizontally disposed in said support means of said rotatable platen and are open at the outer ends and closed at the inner ends, and that said slots intersect the periphery of said rotatable platen adjacent said inner closed ends and are covered by clips at their outer ends.

5. The invention as defined in claim 4 characterized by said support means being pivotally supported and cam means operable to engage and actuate said support means to position said rotatable platen and brake rod in different operating positions.

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