

[54] **HIGH SPEED SERIAL PRINTING
DEVICE FOR TYPEWRITERS,
TELEPRINTERS, CALCULATING
MACHINES, ACCOUNTING MACHINES
AND THE LIKE**

[72] Inventors: **Franco Bretti**, Are di Caluso;
Giuseppe Nuccio, Candia Canavese,
both of Italy

[73] Assignee: **Ing. C. Olivetti & C., S.p.A.** Ivrea,
Turin, Italy

[22] Filed: **April 3, 1970**

[21] Appl. No.: **25,312**

[30] **Foreign Application Priority Data**

April 16, 1969 Italy.....51439 A/69

[52] U.S. Cl. 197/49, 101/93 C

[51] Int. Cl. B41j 1/32

[58] Field of Search 197/18, 55, 49; 101/93

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Edgar S. Burr

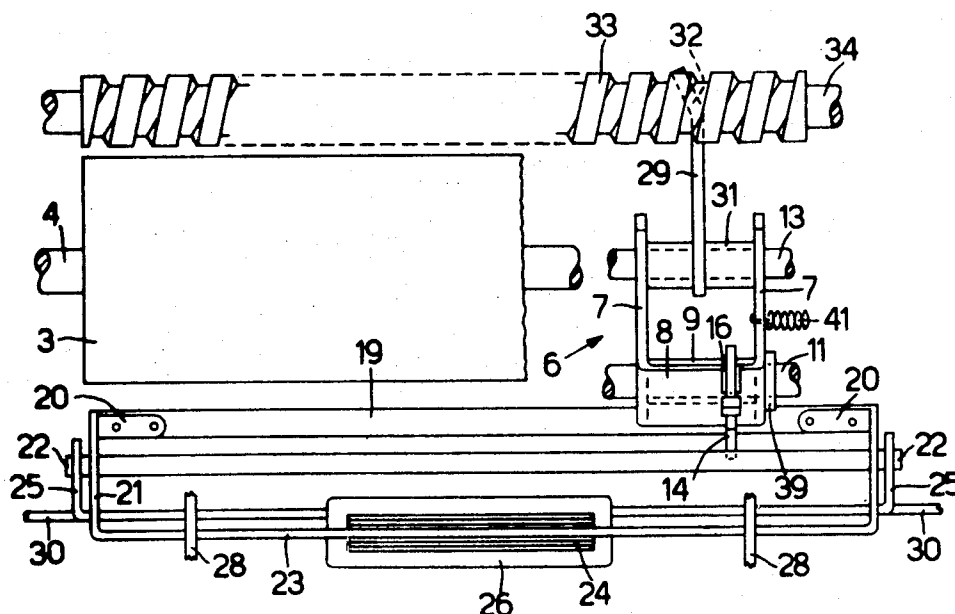
Attorney—Birch, Swindler, McKie & Beckett

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ABSTRACT

A high speed serial printing device comprising a drum rotatable on a horizontal shaft and carrying circumferentially a plurality of rows of types which are struck by a hammer mounted on a carriage movable in parallel to said shaft. The hammer is operated by an electromagnetically controlled universal bar, which is mounted on the frame of the device and is extended parallel to said shaft through the entire length of the drum, as to engage said hammer in every transverse position through which said carriage moves.

1 Claim, 2 Drawing Figures



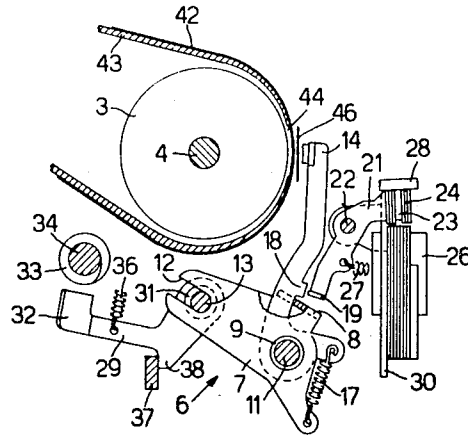


Fig. 1

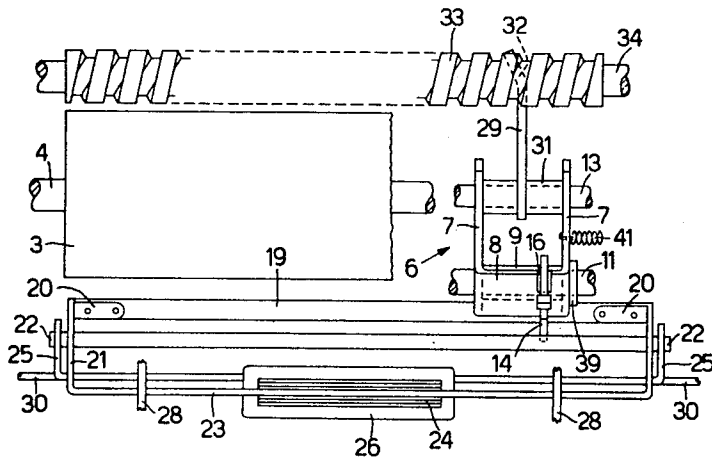


Fig. 2

HIGH SPEED SERIAL PRINTING DEVICE FOR TYPEWRITERS, TELEPRINTERS, CALCULATING MACHINES, ACCOUNTING MACHINES AND THE LIKE

CROSS REFERENCE TO RELATED APPLICATION

Applicants claim priority from corresponding Italian Pat. application Ser. No. 51439-A/69, filed April 16, 1969.

BACKGROUND OF THE INVENTION

The present invention relates to a high speed serial printing device for typewriters, teleprinters, calculating machines, accounting machines, and the like.

The device is comprised of a drum rotatable on a horizontal shaft, which drum carries circumferentially a plurality of rows of types and a hammer mounted on a carriage; the carriage is adapted to move in parallel to said shaft so that the hammer can successively effect the printing of a type from each row.

Several devices of the described type are known in the art. In a known printing device, the means for actuating the hammer consists of an electromagnet, which electromagnet is carried by the carriage and is therefore transversely movable with it. The assembly consisting of the carriage, the electromagnet, and the hammer has, therefore, great inertia when the carriage is transversely moving during the printing operation and when the carriage returns. This large inertia causes the device to be particularly complex and expensive because it is necessary to provide braking means for slowing the carriage and to provide means for adsorbing the shock caused by the carriage return.

SUMMARY OF THE INVENTION

To obviate this disadvantage, a simple and reliable device is utilized. The printing device according to the invention teaches the use of a universal bar mounted on the frame of the device and parallel to said shaft; this bar extends at least the entire length of the drum and is capable of being operated so as to engage said hammer in every transverse position through which said carriage moves.

The carriage constructed in accordance with the invention is very light and does not require any braking means which would otherwise be necessary to prevent the carriage from acceleration on its return.

The foregoing and other object of the invention will become apparent from the following description of the printing device herein illustrated and from the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a partial longitudinal view, seen from the left, of the serial printing device according to the invention.

FIG. 2 is a partial top view of the printing device of FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

The printing device is substantially of the type described in the U.S. Pat. No. 3,331,316 of July 18, 1967 of the Applicant. It comprises a drum 3 (FIG. 1) mounted on a transverse horizontal shaft 4, which shaft continuously rotates and is mounted on the frame of

the machine. The drum 3 carries circumferentially a plurality of rows of digital types and other symbols. The device further comprises a carriage generally indicated by the numeral 6 (FIG. 2) which is provided with two side members 7 connected by a bar 8 and by a sleeve 9 which is slidable on a shaft 11 (FIG. 1), which shaft is secured to the frame of the machine. Each side member 7 is provided with a slot 12 by means of which each side member is transversely driven on another stationary shaft 13.

A hammer 14, which is rotatable about the sleeve 9, is driven in a slot 16 (FIG. 2) of the bar 8, which hammer normally rests, by means of a spring 17 (FIG. 1), against the bottom of the slot 16 (FIG. 2). The hammer 14 is provided with a shoulder 18 (FIG. 1) adapted to collaborate with a universal bar 19 mounted on two brackets 20 (FIG. 2) of a bridge 21. This bridge is fulcrumed on a shaft 22 mounted on two folded back members 25 of a plate 30 which is a part of the frame of the machine. The bar 19 extends transversely through the machine, thereby controlling the shoulder 18 (FIG. 1) of the hammer 14 in any transverse position of the carriage 6, and therefore of the hammer 14 itself. An armature 24 of an electromagnet 26 is mounted on a transverse member 23 (FIG. 2) of the bridge 21, and the electromagnet 26 is mounted on the plate 30. A spring 27 (FIG. 1) normally biases the armature 24 of the electromagnet 26 against two stop members 28.

A lever 29 is secured to a sleeve 31, which sleeve is held between the members 7 and is rotatable and axially slidable on the shaft 13. The lever 29 is disposed between the two side member 7 of the carriage 6. The lever 29 (FIG. 2) is provided with an element formed by an inclined projection 32 adapted to engage an endless thread 33 integral with a shaft 34 continuously rotatable on the frame of the machine. A spring 36 (FIG. 1) normally biases a shoulder 38 of the lever 29 against a movable stop 37.

A spring 41 (FIG. 2) normally biases the carriage 6 against an elastic stop 39. The printing medium is paper 42 (FIG. 1) which is wrapped around the drum 3 by a guide member 43. This member 43 presents a transverse slot 44 in front of the hammer 14. An ink ribbon 46 is disposed between the paper 42 and the hammer 14.

The printing device according to the invention operates as follows:

To start the printing operation the stop 37 is released from contact with the shoulder 38 of the lever 29. This lever 29 can therefore rotate by the action of the spring 36, so that the projection 32 engages the thread 33. After the projection 32 engages the thread 33 (FIG. 2), the carriage 6 is transversely carried to the left by the thread 33.

Signals are now selectively generated in a known manner and they energize the electromagnet 26 at the same moment when the type to be printed passes in front of the hammer 14. The armature 24 rotates the bridges 21 (FIG. 1) in the clockwise direction and the bar 19 strikes the hammer 14 against the drum 3, causing the desired type or symbol to be printed. During the time between two successive signals, the spring 27 again biases the armature 24 against the stop 28.

When the printing of a line is completed, the stop 37 returns to the position seen in FIG. 1 and rotates coun-

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terclockwise the lever 29, causing the projection 32 to be disengaged from the thread 33. The carriage 6 is returned to the right by the action of the spring 41 (FIG. 2) and stops against the elastic stop 39. As the carriage 6 has a very light mass, no braking means are necessary on the carriage, because the friction of the sleeves 9 and 31 on shafts 11 and 13, respectively is quite enough. The elastic stop 39 adsorbs the shock of the carriage 6, when it reaches the end position.

We claim:

1. In a high speed serial printing device comprising a frame, a horizontal shaft rotatably mounted on said frame, a drum secured to said shaft and continuously rotating therewith, said drum carrying circumferentially a plurality of rows of types, a carriage movable parallel to said shaft, means for moving said carriage across said rows of types, and a hammer carried by said carriage and engageable at predetermined instants for successively effecting the printing on the fly of the type, the improvement comprising:

a universal bar coextensive with the path of movement of said carriage and parallel to said shaft, said universal bar being movable between a first posi-

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tion slightly spaced from and out of engagement with said hammer and a second position in engagement with said hammer to cause said hammer to effect a printing stroke,

bridge means pivotally mounted on said frame, said universal bar being attached to said bridge means at a point spaced from the pivot axis of said bridge means, and being movable on said bridge means between said first and second positions,

means normally holding said universal bar in said first position, and

an electromagnet having first and second elements positioned centrally with respect to the path of movement of said carriage, said first element being mounted on said frame and said second element being carried by a member mounted on said bridge means and spaced from the pivot axis of said bridge means, said electromagnet when energized pivoting said bridge means to move said universal bar from said first position to said second position, thereby causing said hammer to effect a printing stroke.

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