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DEVICE FOR ELECTRO-MECHANICALLY RECORDING TELEGRAPHIC IMPULSES

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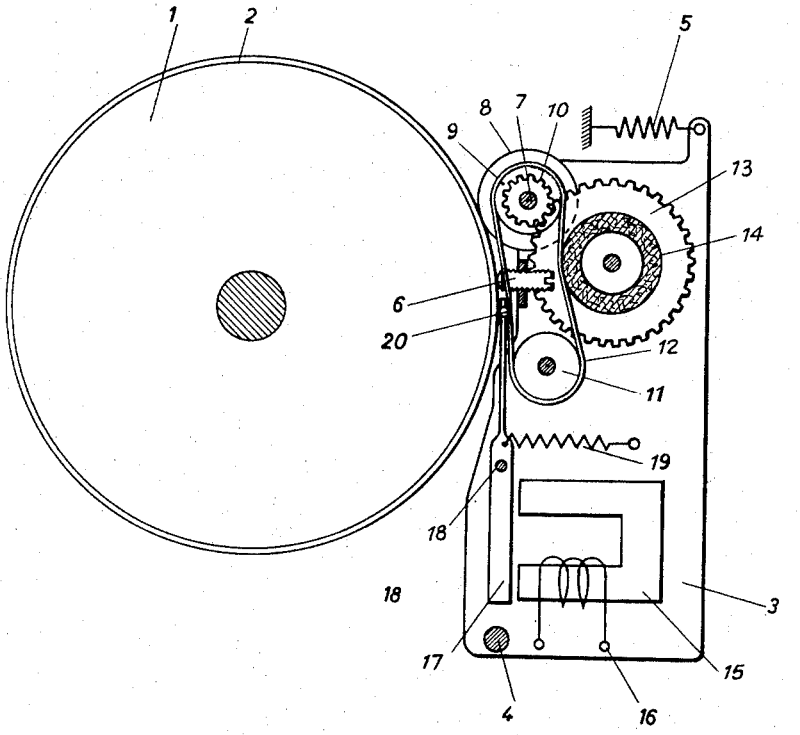

Fig. 1

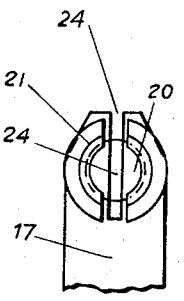

Fig. 3

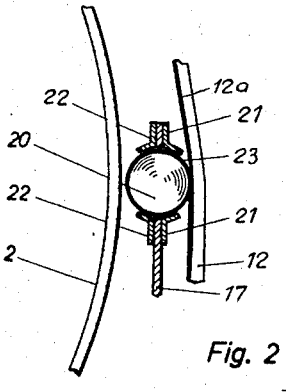

Fig. 2

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DEVICE FOR ELECTRO-MECHANICALLY RECORDING TELEGRAPHIC IMPULSES

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10 Claims. (Cl. 178—96)

This invention is concerned with a device for electro-mechanically recording telegraphic impulses.

In telegraphy, numerous recording devices are known which permit telegraphic signals to be recorded on ordinary paper. For example, code writers or printers are known wherein a rotating roller on which the ink is held by adhesion, is continuously inked by means of an ink-supplying felt roll and wherein the armature of the receiver magnet presses the recording tape against the inked roller for the duration of a code signal. Similarly operating devices are found in tape printers of a known teleprinter system and in page printers for facsimile telegraphy in which the paper is pressed against an inked printing spiral during the picture impulses. Furthermore, page printing arrangements are known in which the paper rests upon a stationary supporting surface while an ink-filled printing wheel is moved against the paper during the signal impulses. These last-mentioned devices employing an ink-filled wheel have the disadvantages that the inertia of the printing mechanism is rather high, and that the ink tends to dry up during prolonged intervals of non-use; the previously mentioned devices employing adhesively inked rollers present on the other hand the advantage of insuring reliable ink transfer even after prolonged interruptions of the operation. It is unfortunate that these relatively bulky inking systems, comprising the ink-supplying felt roller and the printing roller, cannot be moved against the paper sheet, clamped onto a picture drum, with sufficient speed to keep up with the timing of the picture impulses.

The inking system according to the present invention employs a resilient ink carrier which travels in a closed path and which is not operatively actuated to participate bodily in the movement of the stylus or printing element relative to the recording paper. This printing stylus is designed as a rotating sphere or ball or as a small wheel; and only at that point at which this stylus bears against the ink carrier does the latter yield due to its inherent resiliency and participate in the printing motion. In this manner, the inertia of the ink carrier proper is without significance as far as the printing speed is concerned; and the inked stylus ball or wheel may be made sufficiently small and may be mounted on a sufficiently lightweight printing armature or lever to accommodate even the highest picture impulse frequencies. The use of a ball stylus moreover affords the advantages of adhesive ink application which are well known. Since, due to the elasticity of the ink carrier, the ball stylus bears against the carrier continuously, that is, not only during reception of signals (printing) but also during the impulse intervals, the ball will be continuously inked and will be rotated by frictional drive imparted thereto by the ink carrier.

The resilient ink carrier according to the present invention may be a soft-rubber wheel or an endless rubber belt passing over two rolls and positively driven. The drive may, for example be transmitted from a small

motor through a flexible shaft; alternatively, the drive shaft for the ink carrier may be connected with the means for feeding the record paper, as through the intermediary of a friction wheel. Advantageously, the ink carrier in turn is inked by means of a rotating, ink-impregnated felt roller which is connected to the drive shaft for the ink carrier, for example through a gearing.

In order to maintain the ball stylus and the inking system at a predetermined distance from the recording surface, all corresponding parts are mounted on a common base plate which is pivotally mounted at one end and carrying near its other end an adjustable stop which bears against the recording surface.

The ball stylus is mounted in a journal carried by the printing lever, the journal being advantageously slotted at its free end to assure a continuous ink film on the ball.

One embodiment of the invention is illustrated by way of example in the accompanying diagrammatic drawing, in which:

Fig. 1 is a more or less diagrammatic view of the printing mechanism of a facsimile telegraph receiver;

Fig. 2 is a view, on a larger scale, showing the ball stylus of Fig. 1 in its relationship to adjacent parts; and

Fig. 3 is an end view of the ball stylus and its mounting.

Referring now to the drawing, a picture drum **1** has a paper sheet **2** secured thereto. Ordinary recording paper may be used which need not be specially treated for this purpose. Mounted adjacent the drum **1** is a plate **3** which carries the printing mechanism. During rotation of the drum **1**, the plate **3** with the printing elements thereon is slowly displaced longitudinally of the generatrix of the drum so that a helical trace is produced on the recording paper carried by the drum. The mechanism for effecting this longitudinal displacement has not been shown in the drawing.

The plate **3** is mounted for rocking about pivot **4** and is biased in the direction of the drum **1** by the force of a spring **5** so as to urge the stop **6** of the plate into sliding engagement with the paper **2** on the drum. The stop foot **6** is threadedly mounted so as to permit adjustment of the spacing of plate **3** from drum **1** to the desired value by corresponding setting of the stop.

Rotatably mounted on the plate **3** is a shaft **7** to which is secured a friction wheel **8**, bearing against paper **2** carried by the drum **1**. An elastic endless rubber belt **12** passes over roll **9** and a further roll **11**. Gear **10** meshes with a further gear **13** connected to a felt roll **14**. This roll is in intimate contact with the rubber belt **12**.

Rotation of drum **1** drives the friction wheel **8** and thus the rubber belt **12**. The gearing **8**, **13** further transmits the drive to the felt roll **14** which is saturated with ink and continuously applies ink to the rubber belt **12**.

The receiver electromagnet **15** with winding **16** is energized upon reception of picture impulses and attracts its armature **17** in opposition to the force exerted by a spring **19**. The armature **17** is privoded at **18** and constitutes the printing lever.

Rotatably mounted at the free end of the printing lever is the ball stylus **20** which is in intimate engagement with the moving rubber belt **12**. The belt continuously rotates the ball and simultaneously applies ink thereto from the layer of ink carried thereby. When the armature **17** is attracted, the ball stylus **20** strikes against the paper sheet **2** on drum **1** and thereby produces an imprint. The rubber belt **12**, because of its inherent elasticity, remains in engagement with the ball stylus **20** even when the latter moves toward the paper sheet **2**. The stylus is in this manner continuously rotated and inked by the belt **12** even during the printing operation.

The rubber belt **12** not only serves to drive and ink the ball stylus **20** but also acts at the same time as a damper

for the printing lever 17 so as to prevent the latter from bounding during high-speed printing operation.

Fig. 2 shows the ball stylus 20 on a greatly enlarged scale. The ball is disposed in a journal carried by the printing lever 17. In order to prevent the ball from dropping out of its seat in the journal, the journal comprises sheet metal retainers 21 and 22 having bent-over rims. From the ink layer 12*a* carried by the belt 12, a thin ink film 23 is applied to the ball 20 and is continuously renewed by the belt.

Fig. 3 shows the printing lever 17 with the ball stylus 20 in end elevation. The ball journal is formed with a slot 24, and within this slot the ball is not in engagement with its seat. This insures that the ink film 23 on the ball 20 will always be present during rotation of the ball. The figure also shows the arcuate sheet metal retainer members 21 on opposite sides of the slot 24, for journalling the ball in its seat.

The drive for the rubber belt 12 of Fig. 1 may alternatively be effected by a flexible shaft extending from the drive shaft of a small motor to the shaft 7. In that case, friction wheel 8 would be omitted. As a further modification, the elastic rubber belt 12 may be replaced by a sufficiently resilient soft-rubber wheel.

Changes may be made within the scope and spirit of the appended claims.

We claim:

1. A device for electro-mechanically recording on a suitable record telegraphic signals comprising a magnet for receiving said signals, a movably mounted armature controlled by said magnet, a printing lever extending from said armature, a stylus element rotatably disposed in a journal carried by said printing lever at one end thereof, said magnet actuating said armature responsive to signals received thereby so as to move said printing lever to move said stylus element into engagement with said record for the purpose of imprinting thereon marks corresponding to said signals, a rotatable resilient ink carrier, means for rotating said ink carrier, said ink carrier being in engagement with said stylus element for continuously rotating and at the same time continuously inking it in any position thereof relative to said record including its operative printing position in engagement with said record and its nonoperative printing position out of engagement with said record.

2. A device according to claim 1, wherein said stylus element is a ball.

3. A device according to claim 1, wherein said stylus element is a wheel-like element.

4. A device according to claim 1, comprising a journal for said stylus element which has a slot formed therein one side thereof to assure a continuous ink film thereon.

5. A device according to claim 1, comprising a soft rubber roll constituting said resilient ink carrier.

6. A device according to claim 1, comprising an endless rubber belt constituting said rotatable resilient ink carrier, guide rollers for rotatably mounting said belt, and means for positively rotating one of said guide rollers.

7. A device according to claim 1, comprising a drive wheel in driving engagement with said record for rotating said resilient ink carrier.

8. A device according to claim 1, comprising a rotatable ink storage roller in engagement with said resilient ink carrier, and means for rotating said roller to rotate said ink carrier while transferring ink thereto.

9. A device according to claim 1, comprising a pivotally mounted base plate, means for mounting on said base plate said magnet and said armature with said printing lever extending therefrom and said resilient ink carrier and said means for rotating said ink carrier, and means for adjustably securing the position of said base plate relative to the surface of said record.

10. A device according to claim 9, comprising means for adjustably securing the position of said base plate relative to the surface of said record.

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