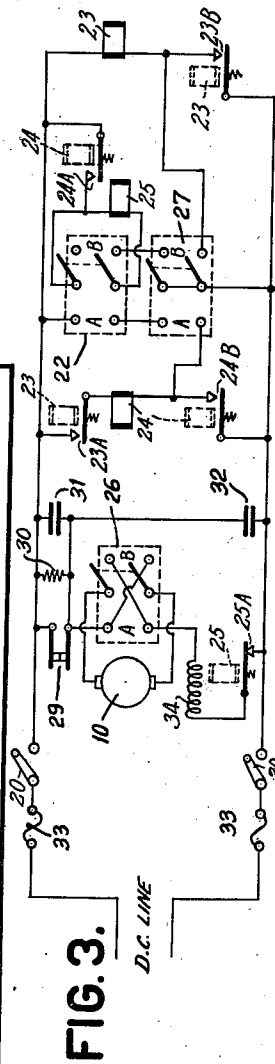


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2,279,073

MARKING DEVICE

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3 Claims. (Cl. 33—21)

This invention relates to marking devices used for the preparation of test samples for determining the characteristics of marks placed upon paper sheets or cards by so-called pencil "leads" or other marking agents of similar character.

In particular, this invention relates to an automatic device for accurately placing test markings upon some suitable sheet material for purposes of comparative testing where the marking pressure, marking speed, and mark dimensions are under electromechanical control.

In the recording art so-called conductive marks placed upon work sheets by graphite pencils are electrically sensed to obtain the information thereby indicated. It is, therefore, important in any process or machine where such marks are employed to record information that the characteristics of these markings be predetermined by suitable tests. Effective tests upon such marks in the form of microscopic inspections, electrical conductivity tests, photographic tests, and abrasive effect tests, can be made. However, unless test samples are uniformly prepared by a standardized and accurate marking method, no matter how effective the tests, the results mean nothing.

It is, accordingly, an object of this invention to provide an improved marking device for the preparation of standard test samples of various kinds of sheet materials upon which marks have been made by various kinds of marking agents.

It is a further object of this invention to provide a marking device, for the preparation of marked test sheets, in which a test sheet clamped about a drum is reciprocated past a weighted marking pencil tracing and retracing a mark upon the sheet for a predetermined number of times at a definite rate, the complete operation being automatically controlled.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawing, which discloses, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawing:

Fig. 1 is a plan view of the marking device showing the arrangement of the various components.

Fig. 2 is a side elevation view of Fig. 1.

Fig. 3 is a circuit diagram of the electrical control features.

Referring to Figs. 1 and 2, a governor-controlled constant speed motor 10 is connected through the gear reduction unit 11. The drum

shaft 12 is turned between the reduction gear bearing and a bearing screw 13. Mounted axially on shaft 12 is the drum 18 which is positioned and held at a given place on shaft 12 by the index pin 19. A pencil receptacle 15, composed of a weight mounted on a slidable tube, has a clamping screw 16 for holding the pencil 14. Co-acting with this receptacle 15 is a stop 17 which acts to hold receptacle 15 in such a position that a pencil clamped in the receptacle will not contact the drum until stop 17 is released. The drum 18 has a sheet clamp 21 provided for holding the sample sheet to be marked in place on the lateral surface of the drum. A manually operated main switch is provided by the double pole single throw toggle switch 20. A double pole double throw toggle switch 22 is provided to be manually operated to index the drum (see explanation later in text).

A double pole double throw toggle switch 27 is so placed that a fin 35 on shaft 12 will engage and operate it when the shaft 12 turns through approximately 270°. This action takes place in either direction of the shaft's rotation. Another double pole double throw toggle switch 26 is connected to switch 27 by link 28 so that its operation coincides with that of switch 27. Switch 26 is operated to reverse the rotation of motor 10, and switch 27 is operated to successively energize the relays 23, 24 and 25 in cooperation with their operating contacts.

Referring to Fig. 3, the entire circuit is protected by fuses 33 and the previously mentioned main line switch 20. The motor 10 has its armature connected through switch 26 in such a way that engagement of that switch in the "A" position will cause the armature to rotate in one direction while with switch 26 engaged at "B" the armature will rotate in the reverse direction, the current in the field 34 of motor 10 being constant. Contacts 29 are governor contacts, centrifugally controlled, which together with the aid of resistor 30 and condensers 31 and 32 tend to keep the motor speed constant.

A test sample is prepared as follows: Sheet material, e. g. paper, is placed about drum 18 and clamped in place by the clamp 21. Switch 22 is set at "B." Switch 20 is now closed and opened to rotate the drum to facilitate paper adjustment, if necessary. The desired marking pencil 14 is inserted into the receptacle 15, clamped in place by the screw 16, and the stop 17 is released allowing the active (marking) end of the pencil 14 to come into contact with the sheet on drum 18. The setup is checked and the

pencil and receptacle are then raised and held by stop 17.

The drum must now be set at the start of the "drum cycle." Switch 22 is set at "A." Switch 20 is now closed and the motor armature rotates until switch 27 is thrown by the fin 35 to the "A" position when the relay 25 is energized and the relay points 25A open, thereby breaking the motor circuit and stopping the drum 18. Switch 20 is now opened, and the receptacle 15 and pencil 14 moved down by releasing stop 17 causing the pencil to contact the sheet on drum 18.

The test sample is now run through a complete "drum cycle." Switch 22 is set at B. Switch 20 is closed and the drum rotates in a given direction until switches 26 and 27 are operated by fin 35, being thrown to their "B" positions. The motor now reverses and relay 23 is energized closing points 23A and 23B, the latter points holding relay 23 energized. The motor continues to operate in the reverse direction until switches 26 and 27 are again operated by fin 35 to their "A" positions. The motor again reverses to its original direction of rotation, and relay 24 is energized, through 23A points, closing points 24A and 24B. Relay 24 is held energized by the 24B points. The motor continues to rotate in the original direction until switches 26 and 27 are again operated by fin 35 to their "B" positions. Relay 25 is now energized through the 24A points and the 25A points open breaking the motor circuit. The cycle is now complete. Switch 20 is opened and the test sample is removed from the drum or re-indexed for another run at a different location on the sheet.

It has been determined by experiment that a mark consisting of a trace in one direction, a retrace in the opposite direction, and a second retrace in the original direction is most desirable for the tests enumerated above. However, by changing the circuit connections or by adding relays, any desired combination of traces and retraces may be secured. A further requirement found by experiment is that drum 18 should be polished and made to rotate positively true upon the shaft 12.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to various modifications, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims:

What is claimed:

1. A mechanism for preparing a test sheet traced upon by a marking pencil comprising a rotatable drum, a clamp on said drum for holding said sheet wrapped about said drum, a shaft upon which said drum rotates, a pin fixing said drum to said shaft in one of several predetermined positions, a driving motor, reduction gearing connecting said motor to said shaft, a reversing switch, a selecting switch, a connecting link joining the said switches for unitary operation, relays, circuit connections between said selecting switch and said relays for successively operating the latter to stop the said motor within a given time, circuit connections between the said reversing switch and the said motor for reversing the rotation of the latter upon operation of the former, a fin upon the said shaft to engage and operate the said switches after said shaft has rotated less than one complete revolution in either direction, and a weighted receptacle for holding the said marking pencil in contact with the lateral surface of the said drum to mark the said sheet as it is rotated past the said pencil.

2. A sheet marking device comprising a drum, a shaft upon which said drum is rotated, a clamp on said drum for holding said sheet wrapped about said drum, a slidable receptacle mounted over said drum for holding a marking instrument, the said receptacle being provided with a weight, the said weight normally urging said receptacle to press the said marking instrument against the lateral surface of the said drum, a stop for holding the said receptacle away from the said drum, a pin for fixing said drum to said shaft, means for rotating said shaft in either clockwise or counterclockwise direction comprising a reversible motor, unitary reversing and selecting switches, relays, and circuit connections, and means for mechanically operating the said switches by a projection on the said shaft to cause the latter to rotate and reverse in cyclic fashion with a period less than 360°, under control of said relays, switches, and circuit connections, for a limited time.

3. An automatic mechanism for marking a sheet comprising a cylindrical member about which said sheet is wrapped, means for holding a marked instrument against the lateral surface of said cylinder with a definite pressure, means for oscillating said cylinder about its axis at constant speed, and means cooperative with the said oscillating means for automatically stopping such oscillation after a predetermined number of cycles.

KARL R. STAUSS.

CERTIFICATE OF CORRECTION.

Patent No. 2,279,073.

April 7, 1942.

KARL R. STAUSS.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the heading to the drawing, name of inventor, for "K. R. STRAUSS" read --K. R. STAUSS--; and page 2, second column, line 49, claim 3, for "marked" read --marking--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of June, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.