

Feb. 26, 1952

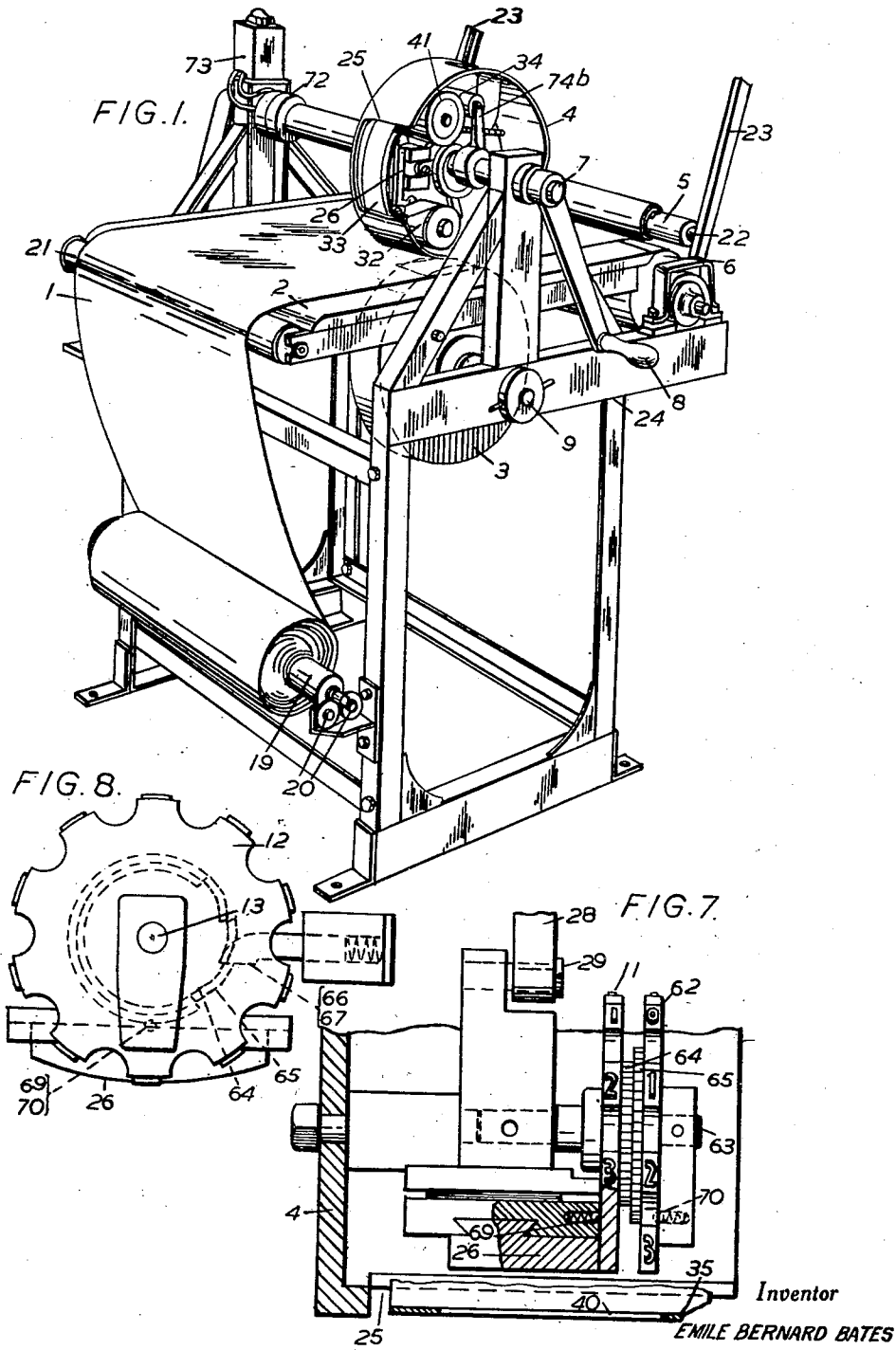
E. B. BATES

2,586,905

MARKING MACHINE FOR MARKING WEB MATERIAL

Filed Feb. 21, 1950

5 Sheets-Sheet 1



Feb. 26, 1952

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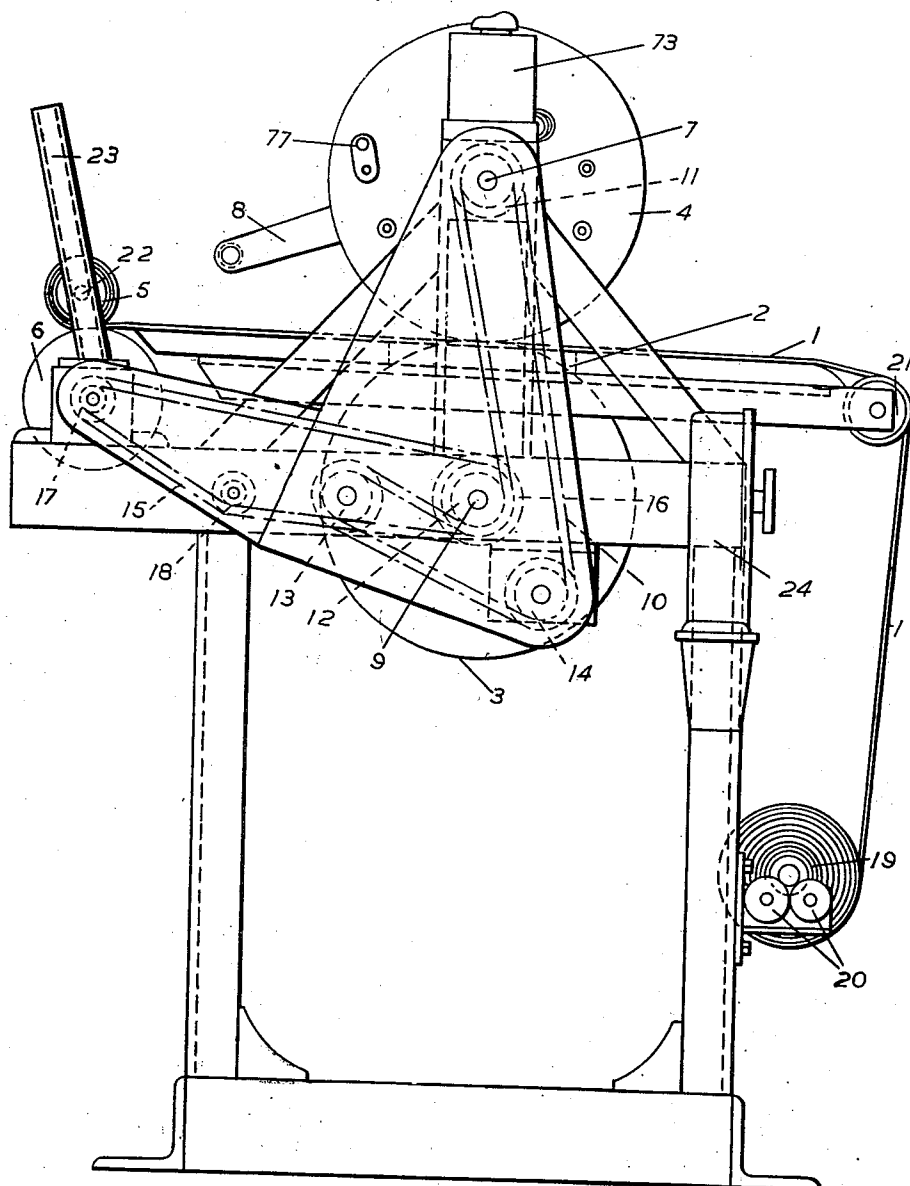
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MARKING MACHINE FOR MARKING WEB MATERIAL

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FIG. 2.



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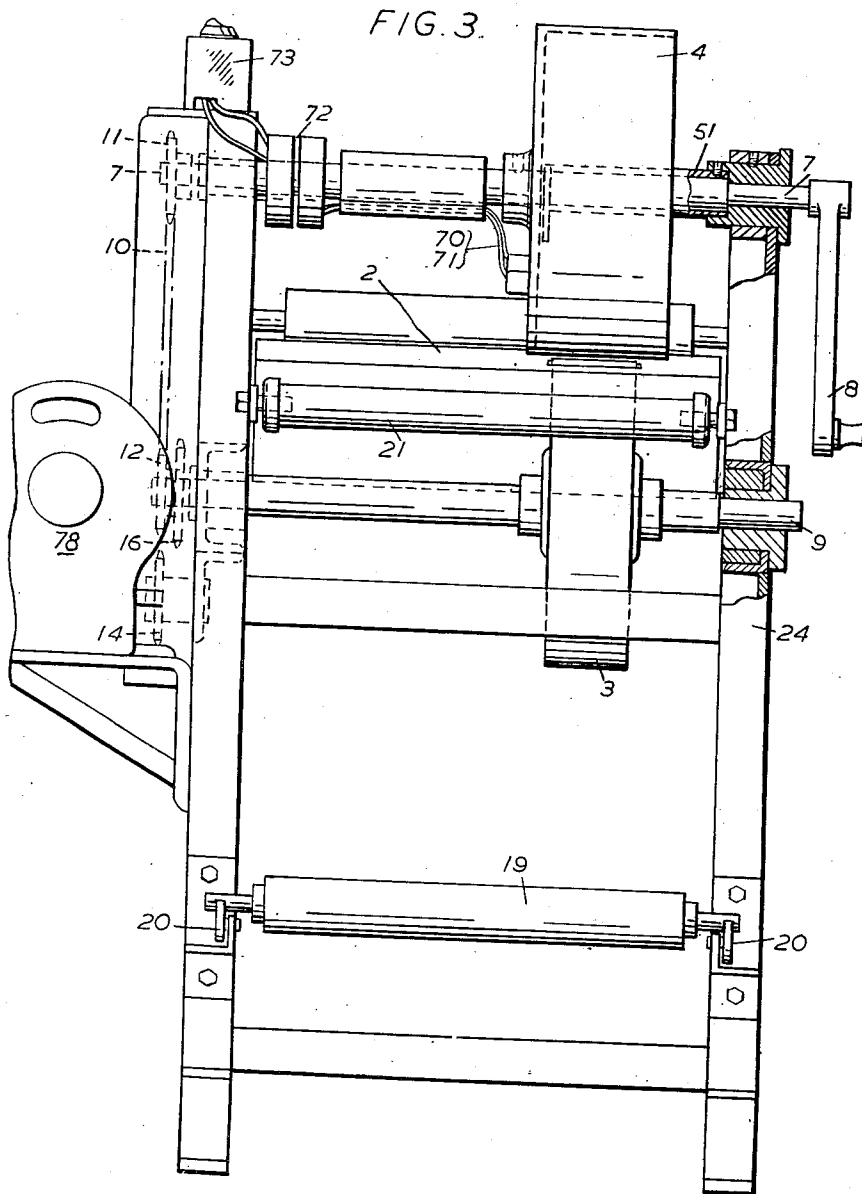
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2,586,905

MARKING MACHINE FOR MARKING WEB MATERIAL

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5 Sheets-Sheet 3



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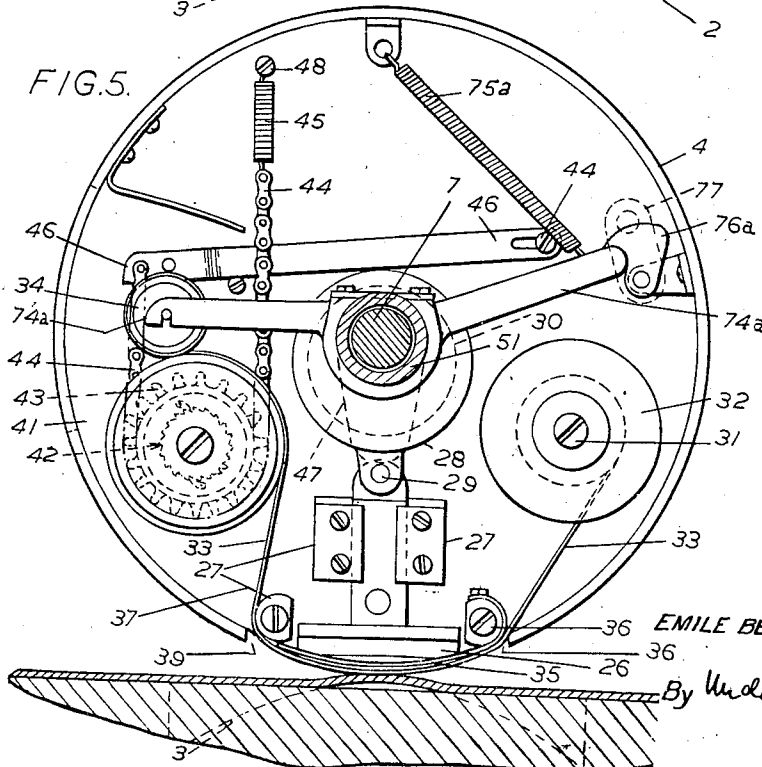
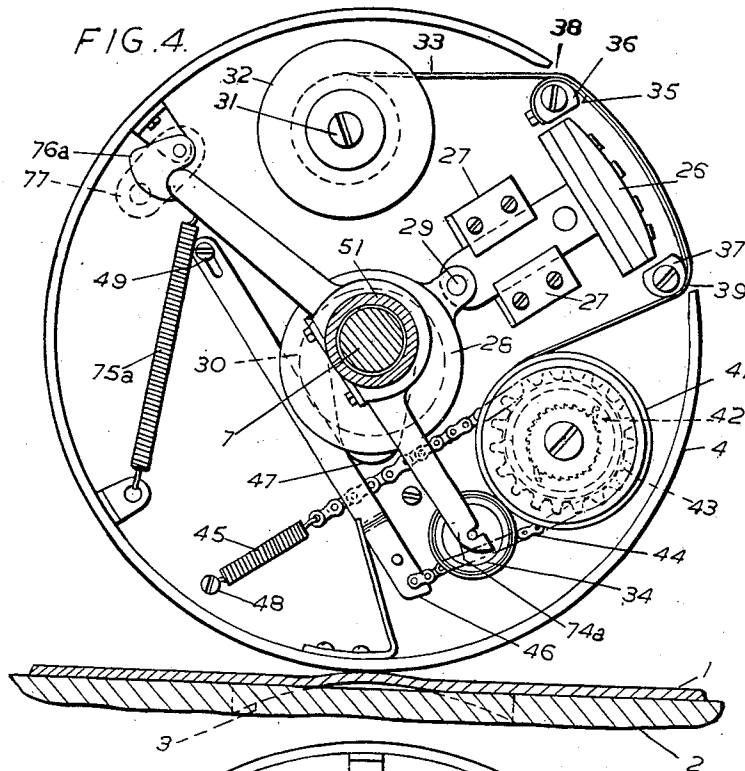
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MARKING MACHINE FOR MARKING WEB MATERIAL

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5 Sheets-Sheet 4



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2,586,905

MARKING MACHINE FOR MARKING WEB MATERIAL

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FIG. 6.

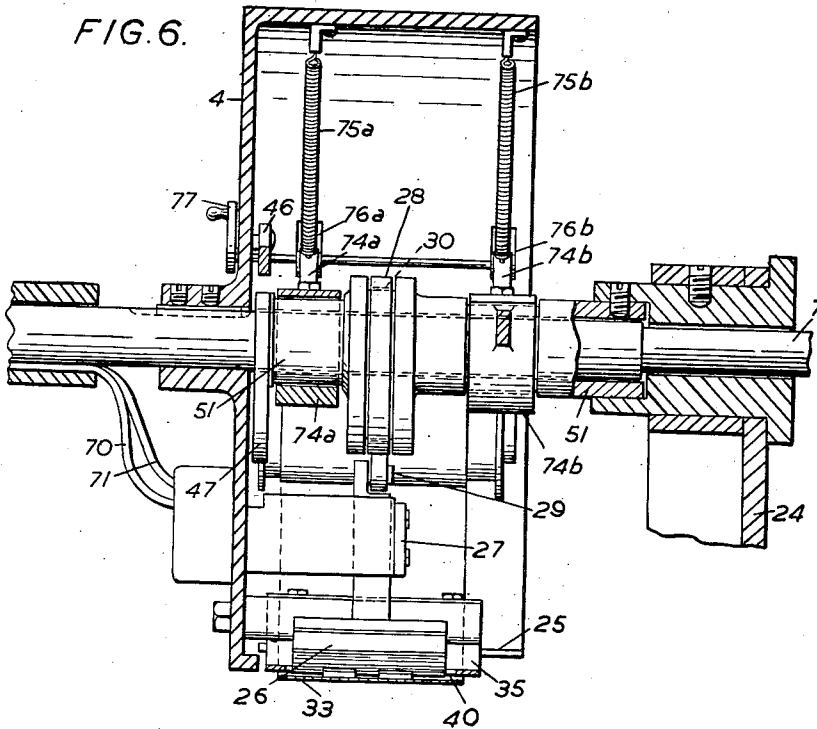
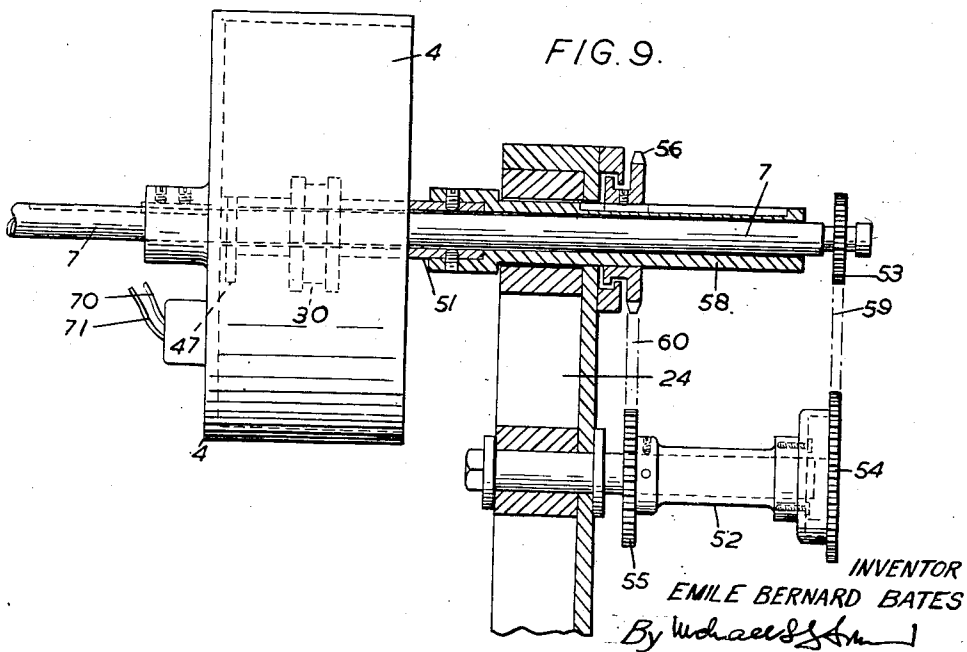


FIG. 9.



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UNITED STATES PATENT OFFICE

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MARKING MACHINE FOR MARKING WEB MATERIAL

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Application February 21, 1950, Serial No. 145,417
In Great Britain February 21, 1949

6 Claims. (Cl. 41-1)

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This invention concerns marking machines for marking web material such for example as knitted or other fabric in the piece and its chief object is an improved marking apparatus for use in such machines.

The invention provides in or for a marking machine for marking web material, marking apparatus comprising a hollow rotatable web-engaging roller or wheel having, mounted to rotate with it, an electric iron mounted for projection to and retraction from an operative position in which it is presented at the periphery of the roller, a mounting for a wound supply of marking ribbon and a take-up means for accumulating the used ribbon, guides for guiding the ribbon from the supply to the take-up means in a path which presents it to be pressed against the web by the projected iron, feed mechanism for feeding the ribbon step by step from the supply to the take-up means the feed taking place upon the retraction of the iron, and mechanism for projecting and retracting the iron. This apparatus has the advantage that it permits the employment of a ribbon which is coated or otherwise treated uniformly along its surface in such manner that, when pressed by the heated iron against the fabric or the like, a mark is applied to the fabric. Therefore the correct and unfailing application for the mark is not dependent upon the accurate register of any given area on the ribbon with the iron at the time that the iron is presented to the fabric and therefore the ribbon feeding arrangements are of a simple character. Furthermore, since the accurate operation of the apparatus is independent of any such registration requirements, the apparatus is suitable for the application of a mark to the web at predetermined linear intervals the linear intervals being for example predetermined by the circumferential dimension of the roller or wheel.

The foregoing and other features of the invention defined in the appended claims are incorporated in the marking machine which will now be described, as a preferred example, with reference to the accompanying drawings in which

Figures 1, 2 and 3 are respectively a perspective view, a side elevation, and a front elevation of the machine;

Figures 4 and 5 are side elevations of the marking drum on a larger scale and partly in section, illustrating its operation;

Figure 6 is a sectional elevation of the drum looking towards the delivery end of the machine;

Figure 7 is a front elevation, partly in section, of the iron and adjacent parts, and Figure 8 is a side elevation thereof;

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Figure 9 is a sectional elevation illustrating a modification.

In one construction of marking machine the fabric or other web 1 to be marked is fed over a table 2 by engagement in the nip between a lower feed roller 3 and an upper marking drum 4 and is accumulated on a roll 5 which is driven by the engagement of a driving roller 6 with the periphery of the fabric windings on the roll. The driving roller 6 is geared to the marking drum 4, the gearing being shown as chain and sprocket gearing. The shaft 7 of drum 4 is provided with a crank handle 8 by which it may be turned and is geared in the ratio 1 to 1 to the shaft 9 of the bottom drum 3 by chain 10 running over sprockets 11, 12, 13, 14. Shaft 9 is geared to roller 6 by chain 15 running over sprockets 16, 17, 18. The web 1 is drawn from a supply roll 19 removably supported on wheels 20, and runs over guide roller 21 to the nip. Take up roll 5 has the ends of its shaft 22 removably received in channelled guides 23.

The foregoing parts are mounted on a suitable inactive frame, indicated at 24, in a manner that will readily be appreciated from the drawing. It will also be appreciated that the driving power is not necessarily applied from the drum shaft 7 and may be derived from an electric motor or line shafting.

The marking drum 4 has a window 25 cut in its periphery at one location and carries inside it an electrically heated iron 26 mounted in guides 27 to reciprocate towards and away from the window. The iron 26 is reciprocated by means of an eccentric strap 28 which is pivotally connected to it at 29 and encircles a stationary eccentric 30. Thus at each rotation of the drum 4 the iron 26 is projected and then retracted and the eccentric 30 is so disposed that the iron occupies its projected position as it reaches the nip (Fig. 5). Within the window 25 there is a flexible ribbon-supporting plate 35 which, as best shown in Figs. 4 and 5, conforms in side elevation to the periphery of the drum 4. The plate 35 is mounted (as a cantilever) at one end, at 36, and its other end rests on an abutment 37; the mounting 36 and the abutment 37 are spaced inwards of the ends of the window 25 so as to have gaps or slots 38, 39, and the plate 35 is cut out at 40 to the shape of the iron 26.

Also mounted within the drum 4 there is a spindle 31 for receiving a spool 32 of marking ribbon 33, and a spool 34 on which the used ribbon is accumulated, and parts 35, 37 which serve as guides for guiding the ribbon 32 from the supply spool 32 to the take-up spool 34 in

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a path which extends through the slots 38, 39 and over the plate 35. Thus the path extends across the windows 25, 40, so that each time the iron 26 is projected it presses a portion of the ribbon 33 against the fabric 1 as shown on Fig. 5.

The take-up spool 34 is driven by the engagement of a rubber-covered driving roller 41 with the periphery of the accumulated wound package of used ribbon, and this driving roller 41 is given a movement of partial rotation each time the iron 26 is reciprocated. The movement of partial rotation is produced by means of pawl-and-ratchet or free-wheel mechanism, operated in each revolution of the marking drum. For example, the driving roller 41 may be driven by pawl-and-ratchet mechanism or free-wheel mechanism 42 from a rotatable driver 43 over which a chain or other flexible element 44 is passed, one end of the element 44 being connected to a tension spring 45 and the other end to a lever 46 which is rocked at each revolution of the marking drum 4 by a cam 47 disposed alongside the eccentric 30. The spring 45 is anchored in at 48 and the lever 46 is pivoted at 49. The stroke of the lever 47, and therefore the length of ribbon wound up at each operation, is regulated by adjustment screw 50. Eccentric 30 and cam 47 are carried on a sleeve 51 and if they are stationary, then the ribbon 33 is fed once at each revolution of the drum, so that a mark is applied to the fabric 1 at each revolution. It may be desired to apply a mark every second, third, etc., revolution, and this effect is achieved by driving the eccentric 30 and cam 47 at the appropriate speed reduction (e. g., 2 to 1, and 3 to 1) relative to the drum 4. A simple mechanism for doing this is shown in Fig. 9. Drum shaft 7 is geared to sleeve 52 by reduction gearing shown as consisting of hub 52, sprocket 53 on shaft 7, sprockets 54, 55 on hub 52, sprocket 56 on sleeve 53 (connected to sleeve 51) and chains 50, 60.

As will readily be appreciated, the outer face of the iron 26 is curved so that when the iron is projected this face conforms to the peripheral surface of the drum 4. The outer face may carry any suitable marking (in relief) which it is desired to apply by means of the ribbon 33 to the fabric or the like 1 and certain or all of this marking may be carried by a member which is capable of being indexed so as to present differing data or characters (e. g. numerals indicative of length) at the outer face of the iron. For example, part of the iron may be constituted by a wheel or wheels having numerals around its periphery the said wheel being stepped round each time the iron is reciprocated so that successive numerals are presented at the face of the iron in their numerical order. Thus in Figs. 7 and 8, two numbered wheels 61, 62 are rotatably mounted on spindle 63 and are provided with ratchet wheels 64, 65 which are racked round by stationary spring loaded pawls 66, 67 each time the iron is retracted. Spring loaded detent mechanism 68, 69 is provided for retaining the wheels in each position to which they are turned, and the wheels derive heat from the main body of the iron 26, which is electrically heated by means of a resistance heating element in a manner requiring no illustration. The leads 70, 71 are fed by way of brush apparatus 72 and a switch 73.

The take-up spool 34 is readily detachable, so that a full spool may be replaced by an empty one. For this purpose, the spool is supported on the ends of levers 74a, 74b which pivot on

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the sleeve 51 and are provided with tension springs 75a, 75b which normally urge the spool 34 against the roller 41. If the levers are moved against the spring tension, the spool may readily be lifted out through the open end of the drum 4. This lever movement is produced by cams 76a, 76b operable manually by a crank 77.

The machine may be provided with a counting appliance 78 for recording or showing the number of revolutions made by drum 4.

The ribbon 33 may consist of a thin paper base with a wax coating at one face; a coating of metal powder is stuck to this wax coating and itself is coated with a thermoplastic adhesive (such for example as rubber or gutta percha) which only becomes tacky on the application of heat. It is the adhesive face which is pressed by the iron 26 against the fabric or other web 1, so that areas of the adhesive corresponding to the relief marking on the iron are melted and transferred to the web together with the registering areas of metal powder.

I claim:

1. A marking machine for placing successive markings on a travelling web of material, comprising a hollow rotary drum with an opening in its circumferential wall, means for rotating said drum, means in said drum for holding a spool of marking tape in freely-rotatable manner, further means in said drum to receive a take-up spool for said marking tape, said further means being movable around the axis of the drum, a driving roller for the take-up spool, a one-way clutch for rotating said driving roller in the take-up direction, a lever pivotally mounted in the drum, the pivotal movements of which drive the said clutch, an apertured tape-guiding plate in the opening in the drum, radial guides in the drum adjacent said opening, an electrically-heated iron slidable in said guides and passing through the aperture in said tape-guiding plate, a supporting roller engaging the circumferential wall of the drum, means for passing the travelling material through the nip between said roller and drum, a stationary eccentric in the drum for advancing the iron outwards as it approaches such nip and retracting it as it leaves the nip, and a stationary cam in the drum for moving the said pivoted lever, to take up the tape after the iron leaves the said nip.

2. A marking machine according to claim 1, wherein the means to receive the take-up spool comprises a pair of levers mounted for movement around the axis of the drum, spring means urging said spool against the driving roller, and cam means, operable from outside the drum for lifting the spool off the driving roller against the resistance of such spring means.

3. A marking machine according to claim 1, wherein the tape-guiding plate is a spring plate, anchored at one end near one end of the opening in the drum, and resting on a support near the other end of the drum, and wherein the means to receive the take-up spool comprises a pair of levers mounted for movement around the axis of the drum, spring means urging said spool against the driving roller, and cam means, operable from outside the drum for lifting the spool off the driving roller against the resistance of such spring means.

4. A marking machine for placing successive markings on a travelling web material, comprising a rotatable marking drum and a feed roller providing a nip for a passage therethrough of the web, which marking drum is hollow and

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has a window in its periphery, an electric iron, means mounting the iron in the interior of the drum for projection to and retraction from an operative position in which it is presented at the window, a mounting for a supply of marking ribbon in the drum interior and take-up means for accumulating the used ribbon in the drum interior, guides for guiding the ribbon from the supply to the take-up means along a path which presents it, at the window, to be pressed by the iron against the web, means for projecting the iron to occupy its operative position while it is at the nip and for retracting it as it rotates from the nip, ribbon-feeding means for feeding the ribbon from the supply to the take-up upon retraction of the iron, and driving means for the drum and roller, said take-up means comprising a pair of levers mounted around the axis of the drum and shaped at the outer ends to hold a take-up spool, a driving roller in the drum to rotate said spool and spring means urging the spool against the driving roller, a ratchet and pawl device for rotating the driving roller step-by-step in one direction, and a stationary cam on the axis of the drum to actuate the ratchet and pawl device as the drum rotates.

5. A marking machine for placing successive markings on a travelling web material, comprising a rotatable marking drum and a feed roller providing a nip for a passage therethrough of the web, which marking drum is hollow and has a window in its periphery, an electric iron, means mounting the iron in the interior of the drum for projection to and retraction from an operative position in which it is presented at the window, a mounting for a supply of marking ribbon in the drum interior and take-up means for accumulating the used ribbon in the drum interior, guides for guiding the ribbon from the supply to the take-up means along a path which presents it, at the window, to be pressed by the iron against the web, means for projecting the iron to occupy its operative position while it is at the nip and for retracting it as it rotates from the nip, ribbon-feeding means for feeding the ribbon from the supply to the take-up upon retraction of the iron, and driving means for the drum and the roller, said take-up means comprising a pair of levers mounted around the axis of the drum and shaped at the outer ends to hold a take-up spool, a driving roller in the drum to rotate said spool and spring means urging the spool against the driving roller, a ratchet and pawl device for rotating the driving roller step-by-step in one direction, and a sta-

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tionary cam on the axis of the drum to actuate the ratchet and pawl device as the drum rotates and wherein the means for projecting the iron comprises a stationary eccentric on the axis of the drum, with an eccentric strap attached to the inner end of the iron.

6. A marking machine for placing successive markings on a travelling web material, comprising a rotatable marking drum and a feed roller providing a nip for a passage therethrough of the web, which marking drum is hollow and has a window in its periphery, an electric iron, means mounting the iron in the interior of the drum for projection to and retraction from an operative position in which it is presented at the window, a mounting for a supply of marking ribbon in the drum interior and take-up means for accumulating the used ribbon in the drum interior, guides for guiding the ribbon from the supply to the take-up means along a path which presents it, at the window, to be pressed by the iron against the web, means for projecting the iron to occupy its operative position while it is at the nip and for retracting it as it rotates from the nip, ribbon-feeding means for feeding the ribbon from the supply to the take-up upon retraction of the iron, and driving means for the drum and roller, said take-up means comprising a pair of levers mounted around the axis of the drum and shaped at the outer ends to hold a take-up spool, a driving roller in the drum to rotate said spool and spring means urging the spool against the driving roller, a ratchet and pawl device for rotating the driving roller step-by-step in one direction, and a cam on the axis of the drum to actuate the ratchet and pawl device as the drum rotates and wherein the means for projecting the iron comprises an eccentric on the axis of the drum, with an eccentric strap attached to the inner end of the iron, and means for rotating the said cam and eccentric at a speed relative to the speed of rotation of the drum according to the spacing required in the successive markings.

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