July 29, 1930. W. H. CHRISTOPHEL, JR 1,771,399

MARKING MACHINE

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Fig. 1.

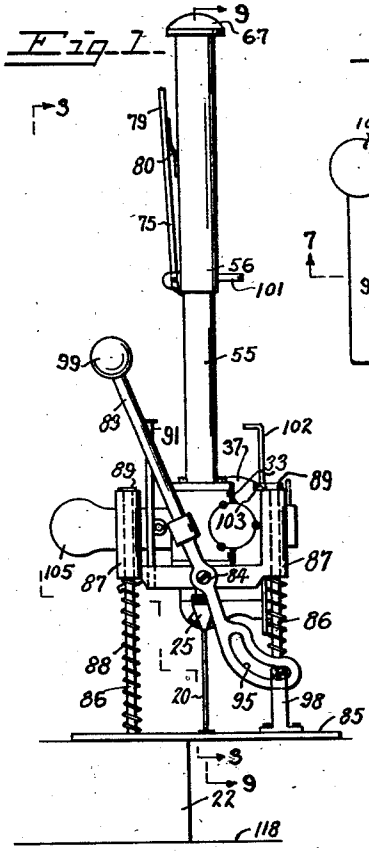


Fig. 2.

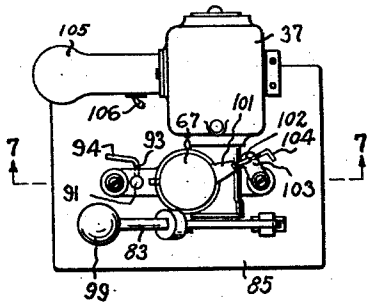


Fig. 3.

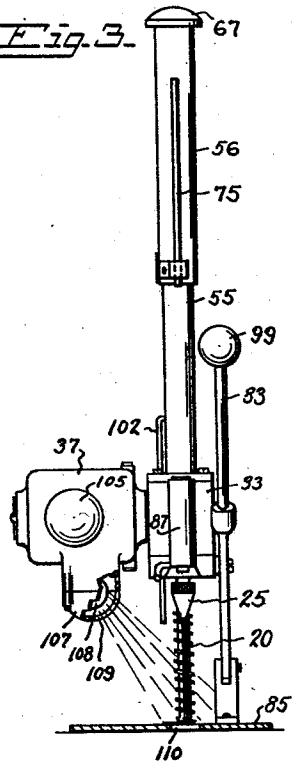
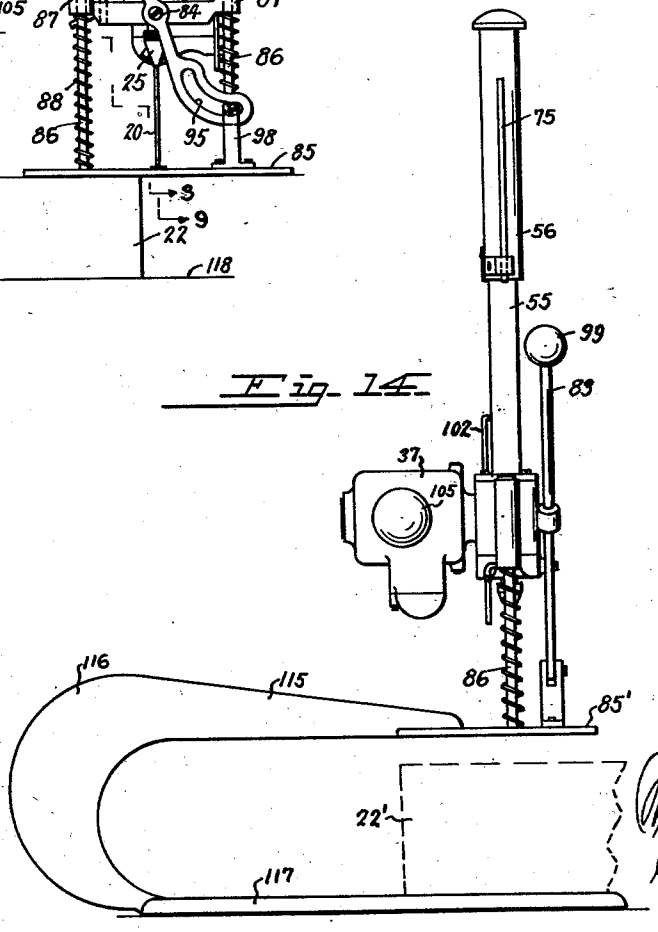


Fig. 4.



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Fig. 4.

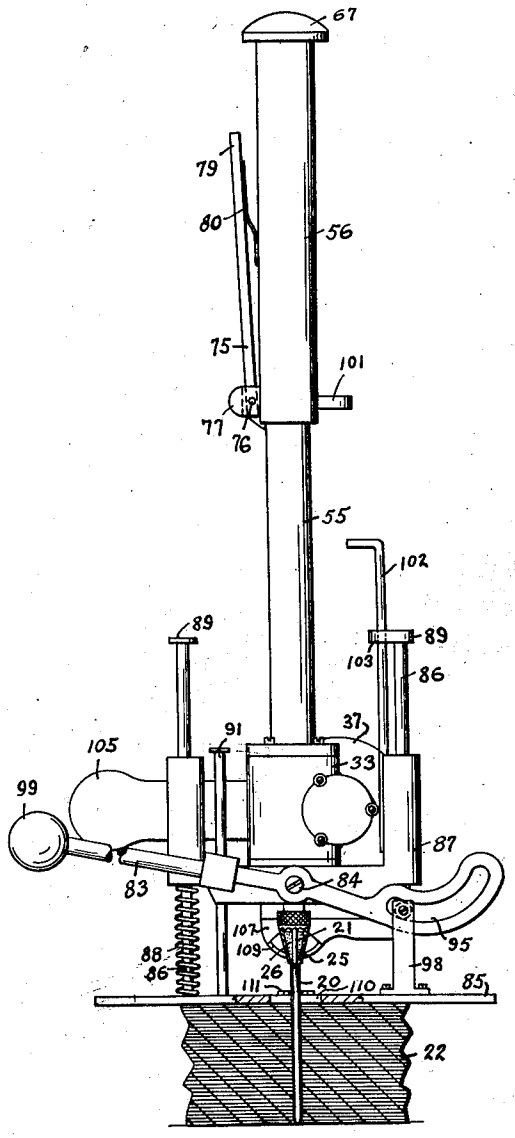
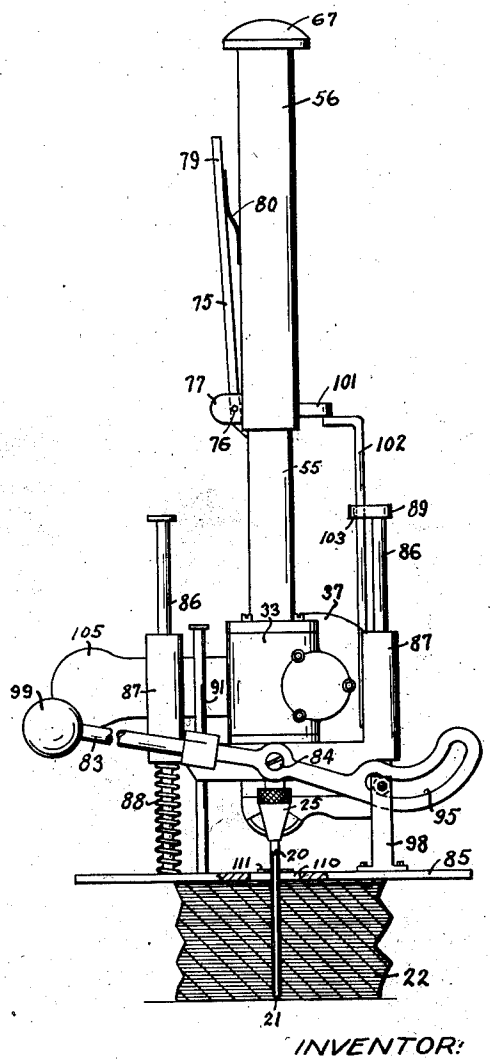


Fig. 5.



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MARKING MACHINE

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Fig. 6.

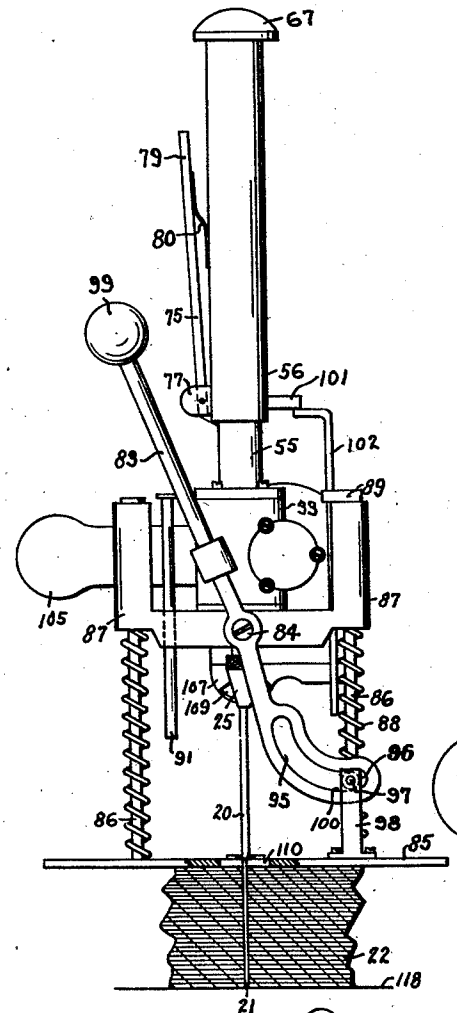


Fig. 8.

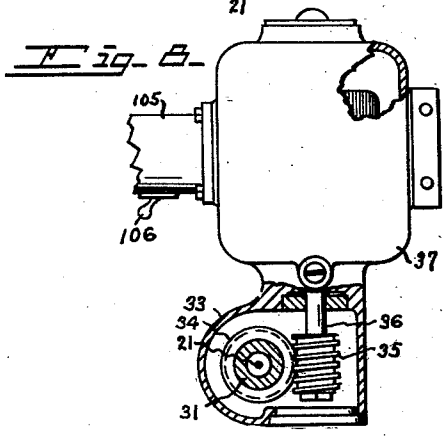
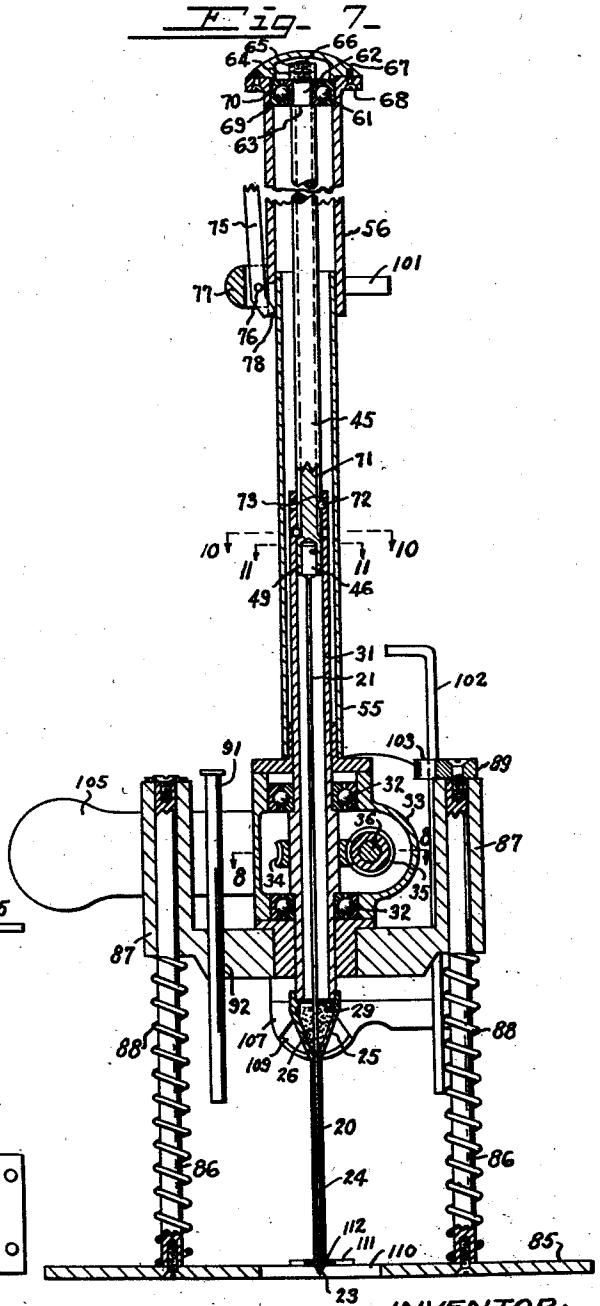


Fig. 7.



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July 29, 1930. W. H. CHRISTOPHEL, JR 1,771,399

MARKING MACHINE

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Fig. 9.

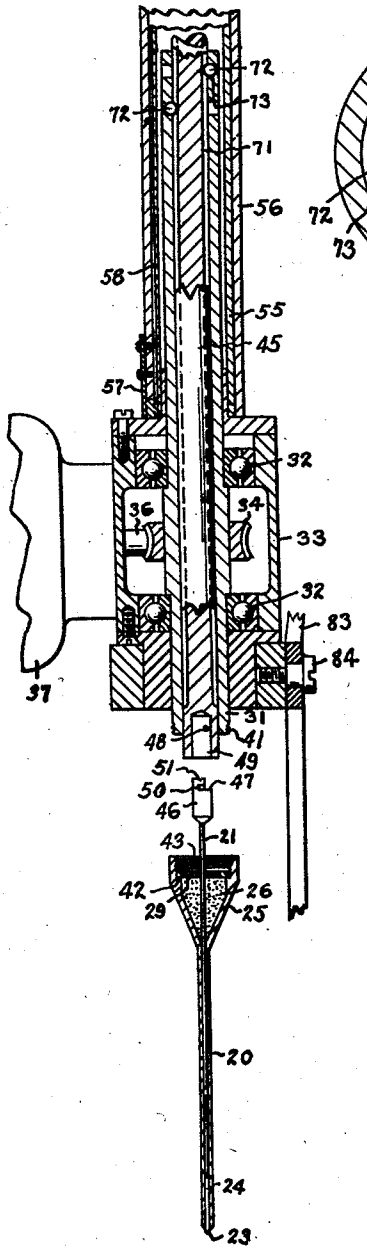


Fig. 10.

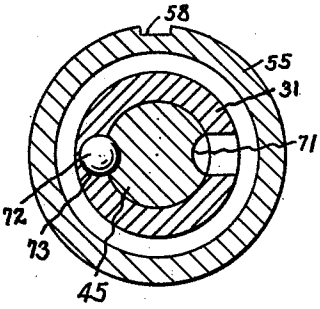


Fig. 11.

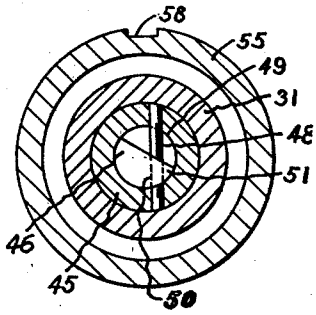


Fig. 12.

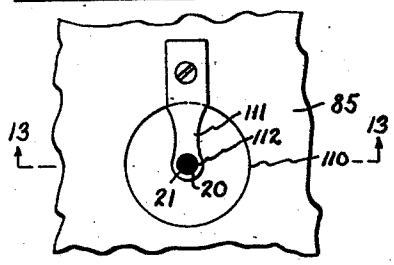
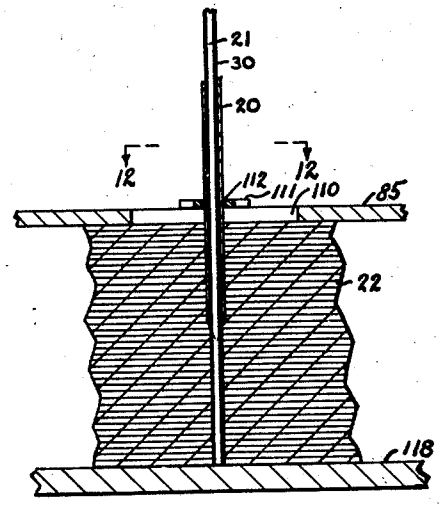


Fig. 13.



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UNITED STATES PATENT OFFICE

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MARKING MACHINE

Application filed October 29, 1928. Serial No. 315,742.

My invention relates to marking machines for marking the respective layers of a pile of fabric employable in the clothing industry and other industries in which fabric is operated on.

Exemplifying its use in the clothing industry it may be stated that where garments are made in quantity on similar patterns, it is the practice to lay the fabric or cloth in layers to form a pile of the fabric, the pile of fabric being cut throughout its thickness according to the desired pattern for forming layers of such piled fabric. The layers of fabric, either prior to or after the cutting, are provided with marks to denote the location of flaps, buttons, button holes, pockets and for other purposes, in order to serve as guides in subsequent operations upon the material.

The means now in general use for marking such layers of fabric have been found unsatisfactory for various reasons. Instancing such objections it may be stated that thread devices are slow and uncertain, besides being tedious and expensive, and that the perforations, made by devices which merely pierce the goods, are not readily discernible by the operator intending to use the perforations as guides for such subsequent operations.

It is the object of my invention to overcome such objections and to provide a device arranged to make marks in superposed layers which are readily discernible in the respective layers, and which can be accurately and economically placed.

It is the object of my invention further to provide a slender marking part for the respective layers of the pile of fabric, and a shield for said marking part so arranged as to shield the marking medium conveyed to the respective layers of the pile of fabric by the marking part; further, to provide telescopable parts, the outer one of which is arranged to perform the main piercing operation and the inner one of which is arranged to perform the marking operation; further, to provide a rotatable piercing needle and an inner marking needle arranged to convey the marking material to the respective layers, the outer piercing needle serving as a shield for such marking material; and, further, to so arrange the parts that the shield is moved out of the pile of fabric while the marking needle with the marking material thereon remains in the fabric for marking the walls of the perforations left by the piercing needle in order that the perforations may be readily discernible in subsequent operations upon the respective layers of fabric.

The invention will be further readily understood from the following description and claims, and from the drawings, in which latter:

Fig. 1 represents a front elevation of my improved device in position for use.

Fig. 2 is a plan view of the same.

Fig. 3 is a side elevation of the same, partly in section on the line 3—3 of Fig. 1, and partly broken away.

Fig. 4 is a front elevation of my improved device, partly broken away, showing the piercing needle in depressed relation for piercing the goods, with the marking needle correspondingly lowered but with its lower end at the top portion of the piercing needle.

Fig. 5 is a similar view, with the marking needle also in depressed relation.

Fig. 6 is a similar view, but showing the marking needle maintained in depressed relation and the piercing needle in relatively raised relation.

Fig. 7 is an axial section of my improved device, taken on the line 7—7 of Fig. 2, showing the parts in normally raised relation, and partly broken away.

Fig. 8 is a horizontal section of a detail of my improved device, taken in the plane of the line 8—8 of Fig. 7, and partly broken away.

Fig. 9 is an axial section of my improved device, taken on the line 9—9 of Fig. 1, partly broken away, and showing the needles separated from their attaching means.

Figs. 10 and 11 respectively, are cross-sectional detail views of my improved device, respectively in the planes of the lines 10—10 and 11—11 of Fig. 7.

Fig. 12 is a detail in section in the plane of the line 12—12 of Fig. 13.

Fig. 13 is an enlarged axial section, taken in the plane of the line 13—13 of Fig. 12,

showing the manner of shielding the coating on the piercing needle and transferring it to the fabric; and,

Fig. 14 is a side elevation of a modification of my improved device.

In the present exemplification of my invention there is an outer piercing part 20 and an inner marking part 21, which are permitted relative reciprocation so as to place the piercing part at the outside in piercing the fabric 22, and to expose the marking part in the pierced layers of fabric, by moving the piercing part out of the pile of fabric, the marking part being provided with suitable marking material transferred to the walls of the perforations left by the piercing part, for providing the respective layers of the pile of fabric with markings, readily discernible by the operator in subsequent operations upon the respective layers of fabric.

The piercing part is exemplified as a tubular needle provided with a piercing end 23 for readily piercing the pile of fabric.

The marking part is exemplified as a marking stem or shank, hereinafter referred to as a marking needle, and is arranged to be received in the bore 24 of the piercing needle.

The means for supplying the marking needle with marking material is exemplified as a reservoir 25, in which a body 26 of marking material is contained. This marking material may be any suitable substance for the purpose, and may for instance be color pigments in a suitable carrier, preferably a slow drying oil, such as glycerine. The reservoir is shown coaxial with the piercing needle and with the marking needle. The lower end of the marking needle preferably substantially closes the lower end of the reservoir into the bore of the piercing needle, when the marking needle is in its uppermost position. (See Fig. 7.) There is preferably a wiping pad 29 at the upper end of the reservoir, for wiping the marking needle during raising movements of the marking needle, and maintaining the marking material in the reservoir.

The relative diameters between the marking needle and the bore of the piercing needle are preferably such that upon relative movement between the marking needle and the piercing needle in directions to move the marking needle into the piercing needle or to expose the marking needle beyond the piercing needle, sufficient of the marking material is imparted to the outer periphery of the marking needle to form a thin coating 30 of the marking material on the marking needle. (See Fig. 13.)

Rotation is also preferably imparted to the needles. Thus a sleeve 31 is journaled by bearings 32 in upright position in a frame 33. The sleeve has a worm-wheel 34 rigid therewith, which is meshed by a worm 35 on the rotor-shaft 36 of an electric motor 37 supported by the frame.

The sleeve has a lower threaded end 41 about which the upper threaded end of the reservoir 25 is threaded. (See Fig. 9.) The wiper 29 is located between the lower end of the sleeve and an annular shoulder 42 in the reservoir. The wiper may be a felt wiper, and is provided with an aperture 43 through which the marking needle is received.

A spindle 45 is axially reciprocable in the sleeve. The upper end of the marking needle is releasably secured to the lower end of the spindle. For instance, the upper end of the marking needle is provided with a head 46, provided with an end rabbet 47. A pin 48 is in a socket 49 in the lower end of the spindle. (See Figs. 9 and 11.) The pin is at one side of the axis of the spindle. The head has a recess 50 extending from the rabbet 47 for forming a hook 51 received above the pin when the head is rotated relatively to the spindle for locking the needle to the spindle. (See Figs. 9 and 11.)

A tube 55 extends upwardly from the frame and is preferably rigid with the frame. A tube 56 telescopes with relation to the tube 55. (See Figs. 6 and 7.) A key 57, (Fig. 9), fixed to the tube 56 is received in a slot 58 extending lengthwise in the tube 55 for preventing relative turning between the tubes.

There is a bearing 61 between the upper end of the spindle and the upper end of the tube 56. (See Fig. 7.) This bearing is shown as a ball-bearing, the inner raceway thereof being received about a reduced end 62 of the spindle between a shoulder 63 on the spindle and nuts 64, 65, threaded to the threaded upper end 66 of the spindle. A cap 67 is releasably secured to the upper end of the telescoping tube 56, as by screws 68, and holds the ball-bearing in down position.

The outer raceway of the ball-bearing 61 is positioned between an annular shoulder 69 in the upper end of the tube 56 and an annular flange 70 on the cap 67. This ball-bearing is represented as a radial and end thrust ball-bearing, causing the spindle to move axially with the axial movement of the tube 56.

The spindle is provided with longitudinal grooves 71 in which balls 72 in holes 73 in the sleeve 31 are received, for securing the sleeve and the spindle rotatively together, but permitting relative axial movements between the sleeve and the spindle. (See Figs. 9 and 10.) The grooves 71 are open at the upper end of the shank so that if the nuts 64, 65, are removed, the shank may be moved axially downwardly out of the sleeve (see Fig. 7). The lower end wall of one of the grooves engages the lower ball for limiting upward movement of the upper tube 56.

A readily releasable clamp 75 positions the tube 56 axially relatively to the tube 55. (See Figs. 6 and 7.) This clamp is shown as a lever

pivoted at 76 in a lug 77 extending from the tube 56, and having a biting edge 78 arranged to bite upon the outer periphery of the tube 55. The lever has a handle 79 extending lengthwise of the tube 56. A spring 80 is located between the handle and the tube for normally pressing the handle outwardly for clamping relation of the clamp. The operator's hand grasping the tube 56 is arranged to readily grasp or release the handle 79 for readily clamping and unclamping the clamp.

85 represents a supporting plate, from which posts 86 extend rigidly upwardly. (See Figs. 6 and 7.) The frame 33 is a slidable frame and is provided with slide bearings 87, slidable up and down on the posts. An operating lever 83 is pivoted on a shoulder screw 84 to the frame. This frame is normally held in up-position by means of springs 88 surrounding the posts. The respective ends of the spring are resisted by the support and the frame. Upward movement of the frame is limited by flanges 89 at the upper end of the posts.

A stop-rod 91 is slidable up and down in a bearing 92 on the frame, and is arranged to be clamped in adjusted positions by means of a clamp-screw 93 provided with a handle 94. (See Figs. 2, 6 and 7.)

Limiting the descent of the piercing needle by reason of the adjustable stop avoids injury to the support or table.

The lower end of the marking needle is preferably blunt so that injury to the support or table by it is avoided. Descent of the marking needle relatively to the piercing needle and the supporting plate 85 is also preferably adjustably limited, as by a lug 101 on the tube 56 arranged to strike a stop-rod 102, adjustable up and down in a bearing 103 in a lug on one of the flanges 89, and clamped in adjusted positions in the bearing by a clamp-screw 104. The stop-rod may be provided with a bent end reaching into range of the lug 101, and be prevented from turning in its bearing 103. This forms a stop for the upper tube 56, gaged by a stationary part, as by the flange 89, post 86 and supporting plate 85, permitting relative movement up and down of the frame 33 on the posts while the tube 56 and the marking needle are held in down position.

Means are provided for equalizing the pressure upon the lever necessary to compress the springs throughout the full movement of the frame 33. As the springs compress they offer greater resistance to compression. For equalizing this resistance I provide the lever with a cam-slot 95, in which a roller 96 journaled on a pin 97 of a lug 98 extending from the supporting plate 85, is received. (See Figs. 4, 5 and 6.) The cam-face of this cam-slot recedes in increasing ratio laterally from a right line intersecting the pivot of the lever and the beginning portion of the cam-slot, as the cam-slot recedes from the pivot. The lever is provided with a handle 99.

When the handle is depressed the lowermost more greatly bent portion 100 of the cam face coacts with the roller during the first portion of the movement of the lever, straighter portions of the cam face coacting with the roller progressively as the lever is depressed to further extent and the springs are compressed to further extent, thereby increasing the leverage as the resistance increases.

The frame is provided with a handle 105 shown extending from the motor casing. (See Figs. 1, 2 and 3.) The handle may be provided with an electric switch 106 for respectively controlling, energizing and stopping the motor.

The frame may be provided with a cover 107 for an electric light bulb 108, the cover being provided with an opening 109 for projecting the rays of light from the electric light bulb, to an opening 110 in the supporting plate 85, so that the point of desired application of the marking tool may be readily perceived. (See Figs. 3, 12 and 13.)

There is preferably a guide 111 extending from the wall of the opening, the guide being preferably a narrow guide provided with a hole 112 through which the piercing needle is received and by the wall of which it is guided. (See Fig. 12.)

In the modification shown in Fig. 14, the supporting plate 85′ is supported by an overhanging arm 115 of a goose-neck frame 116, the lower portion 117 of which forms a support for the pile of fabric, exemplified at 22′.

In employing my improved device, and referring to Figs. 1 to 13 inclusive, the frame 33 is normally in raised relation. The upper tube 56 is also normally in raised relation. This relation of the parts is exemplified in Figs. 1, 3 and 7. When it is desired to mark the fabric, the device is placed on the pile of fabric 22, for instance on a pattern thereon provided with markings corresponding to the desired markings of the layers in the pile of fabric, the end of the piercing needle being placed in line with the desired mark.

Movement of the device is readily accomplished by the operator grasping the upper tube 56 without, however, operating the clamp 75, or by means of grasping the handle 105, or both the tube and the handle.

It is understood the motor has been started. The operation of the motor rotates the sleeve 31 and the spindle 45, rotating the piercing needle and the marking needle, the reservoir 25 also rotating in the present exemplification. The marking needle is in extreme upward position, as exemplified in Fig. 7.

In order to limit the depth to which the needles shall be lowered for a given height of pile of fabric, the device is first placed at the edge of the pile of fabric, and the needles

depressed until the lower end of the piercing needle touches the surface 118 or table, on which the pile of fabric is laid. The stop 91 is then lowered for causing its lower end to engage the supporting plate 85, the stop being clamped in this position by the clamp 93, for limiting the downward movements of the piercing needle in the subsequent operation upon such pile of fabric.

The tube 56 is then lowered for moving the lower end of the marking needle 21 against the surface or table 118. The stop-rod 102 is then adjusted in its bearing 103 so as to be engaged by the lug 101 on the tube 56, in which position the stop-rod 102 is clamped in its bearing 103 by the clamp-screw 104. This prevents undue downward pressure upon the marking needle.

When the stops have been thus positioned, the device is moved so that the lower end of the piercing needle is in axial line with the desired mark on the pile of fabric.

The operator then grasps the handle 99 and depresses the frame 33, which depresses the needles in their predetermined relations, as shown in Fig. 4. This action causes the piercing needle to pierce the pile of fabric to its full depth, but prevents further axial movement of the piercing needle on account of the coaction of the stop 91 with the plate 85.

The operator then grasps the tube 56 and releases the clamp 75 and depresses the tube, thereby depressing the marking needle, and moving the lower portion of the marking needle through the reservoir, for coating the marking needle with the marking material in the reservoir. (See Fig. 5.) The thickness of this coating is limited by the space between the outer periphery of the marking needle and the inner periphery of the piercing needle, (see Fig. 13), the upper end of the wall of the bore 24 in the piercing needle serving as a wiper for wiping the desired thickness of film of marking material on the marking needle. The tube 56 is depressed until the lower end of the marking needle engages the supporting face or table. This movement takes place within the piercing needle, which acts as a shield for the marking needle, for separating the marking needle and the marking material thereon from the fabric.

This downward movement of the marking needle takes place until the lug 101 strikes the bent end 102′ of the stop-rod 102, for limiting the downward movement of the marking needle and preventing injury to it.

It will be understood that axial movement of the tube 56 and of the marking needle may take place before the combined axial movements of the piercing needle and the marking needle, for first placing the lower end of the marking needle at the lower end of the piercing needle.

After the piercing needle and the marking needle have been brought into extreme down position, the piercing needle is raised by raising on the handle 99 while the marking needle is held in down position, the clamp 75 being still maintained in release position. (See Fig. 6.) The raising of this piercing needle or shield away from the marking needle exposes the marking material on the marking needle, and the marking needle, to the fabric, (see Fig. 13), that is, to the walls of the perforations made by the piercing needle in all the layers of the pile of fabric, for transferring marking material on the marking needle to such walls of the perforations in the respective layers.

It will be understood that the piercing needle preferably does not cut the fibres of the fabric, but merely separates them for forming temporary perforations in the fabric, the walls of the perforations crowding upon the marking needle as soon as the piercing needle is raised for receiving the coloring or marking, the perforations, as well as the coloring or marking, preferably disappearing or being removed after the subsequent operations upon the fabric.

The tube 56 is then raised, which raises the marking needle and wipes the marking material on the marking needle against the walls of the perforations in the respective layers of the pile of fabric. This is a return to the initial position shown in Figs. 1, 3 and 7.

The respective layers of the pile of fabric are thereby provided with uniform markings which are readily distinguishable in the respective layers. Pigments of various colors may be employed in the marking material, depending on the color of the fabric operated on. Marking material of various constituents may also be employed, depending on the material operated on. Some of the fabric will require marking material which is more readily absorbed than others, or which is more readily removed after performing the subsequent operations on the goods than others, some fabrics requiring drier marking material and some wetter marking material. The reservoir and needles are readily removable for changing of marking materials and for cleaning.

In the form of device shown in Figs. 1 to 13 inclusive the marking device is primarily intended for being moved with relation to the pile of fabric. In the modification shown in Fig. 14, the pile of fabric is preferably manually moved with relation to the marking device.

In employing the modification shown in Fig. 14, the pile of fabric has a pattern placed thereon provided with markings corresponding with the desired markings of the layers in the pile, as hereinbefore explained with reference to the form of the device shown in

Figs. 1 to 13 inclusive. The pile of fabric is manually moved to place the respective markings on the pattern in line with the piercing needle. Manipulations of the parts above the plate 85′ for making the markings in the respective layers take place at each of such markings as hereinbefore explained with reference to the form of the device shown in Figs. 1 to 13 inclusive.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In combination, in a marking device for marking layers of piled fabric, a slender color-imparting marking part adapted to be provided with color and a fabric-piercing shield therefor for shielding said slender color-imparting marking part while entering the respective layers of the fabric, and arranged whereby said color on said slender color-imparting marking part is exposed to the walls of the perforations made by said shield in the respective layers of said piled fabric upon withdrawal of said shield for color-marking said respective layers.

2. In combination, in a marking device for marking layers of piled fabric, a slender marking part adapted to be provided with marking pigment, and a shield for said marking part for shielding said pigment while said slender marking part is entering the respective layers of the piled fabric, and means for withdrawing said shield whereby said marking pigment is exposed to the respective layers of said piled fabric for marking said respective layers.

3. A fabric marking device for marking the layers of a pile of fabric comprising a marking needle, a shield thereabout, means whereby to cause penetration of the fabric by the shield, means whereby to move the shield out of the fabric while permitting the marking needle to remain in the fabric and thereby marking the respective layers of the pile of fabric, and means whereby to move the marking needle out of the fabric.

4. A fabric marking device for marking the layers of a pile of fabric comprising a marking needle provided with a removable marking coating, a shield thereabout, means whereby to cause penetration of the fabric by the shield, means whereby to move the shield out of the fabric while permitting the marking needle to remain in the fabric and thereby transferring removable marking coating from said marking needle to the respective layers of the pile of fabric, and means whereby to move the needle out of the fabric.

5. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle arranged for lengthwise movement therein, color imparting means for said marking needle, and means whereby to relatively reciprocate said needles.

6. In a fabric marking device for marking the layers of a pile of fabric, the combination of a marking needle, a tubular piercing needle arranged thereabout, color imparting means for said marking needle, means for rotating said needles, and means whereby to relatively reciprocate said needles.

7. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a reservoir for marking material for providing said marking needle with marking material, and means whereby to move said needles in piercing directions and to move said tubular piercing needle out of the fabric for exposure of said marking needle in the respective layers of the fabric for transference of marking material from said marking needle to said respective layers of the pile of fabric.

8. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a reservoir for marking material for providing said marking needle with marking material, means for rotating said needles, and means whereby to move said needles in piercing directions and to move said tubular piercing needle out of the fabric for exposure of said marking needle in the respective layers of the fabric for transference of marking material from said marking needle to said respective layers of the pile of fabric.

9. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a frame, means for rotating said needles on said frame, a support, means whereby to reciprocate said frame on said support in piercing direction and in opposite direction, and means whereby to independently axially move said marking needle.

10. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a frame, means for rotating said needles on said frame, a support, compression springs for normally holding said frame in raised position relatively to said support, and means for depressing said frame on said support comprising a lever, a cam part and a coacting part, one of said parts located on said lever and the other of said parts located on said support and so formed as to equalize the pressure upon said lever throughout the compressive movements of said springs.

11. In a fabric marking device for marking the layers of a pile of fabric, the combina-

tion of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a frame, a reservoir for said marking needle, means for rotating said needles and said reservoir on said frame, a support, means whereby to reciprocate said frame on said support in piercing direction and in opposite direction, and means whereby to independently axially move said marking needle.

12. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a frame on which said needles are mounted, a support, means whereby to reciprocate said frame on said support in piercing direction and in opposite direction, means whereby to independently axially move said marking needle, and an adjustable stop between said frame and said support for adjustably limiting movement of said frame toward said support.

13. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a frame on which said needles are mounted, a support, means whereby to reciprocate said frame on said support in piercing direction and in opposite direction, means whereby to independently axially move said marking needle, an adjustable stop for said last-named means, and an adjustable stop between said frame and said support for adjustably limiting movement of said frame toward said support.

14. In a fabric marking device for marking the layers of a pile of fabric, the combination of a tubular piercing needle, a marking needle shielded by said tubular piercing needle, a frame, means for rotating said needles on said frame, a support, means whereby to reciprocate said frame on said support in piercing direction and in opposite direction, means whereby to independently axially move said marking needle, and a releasable clamp for said last-named means for fixing the axial relation between said marking needle and said piercing needle.

In testimony whereof, I have hereunto signed my name.

WILLIAM H. CHRISTOPHEL, JR.