Nov. 29, 1960 P. N. BRAUN 2,961,945

IDENTIFICATION MARKING MACHINE EMPLOYING HEATED TYPE

Filed Dec. 8, 1958 5 Sheets-Sheet 1

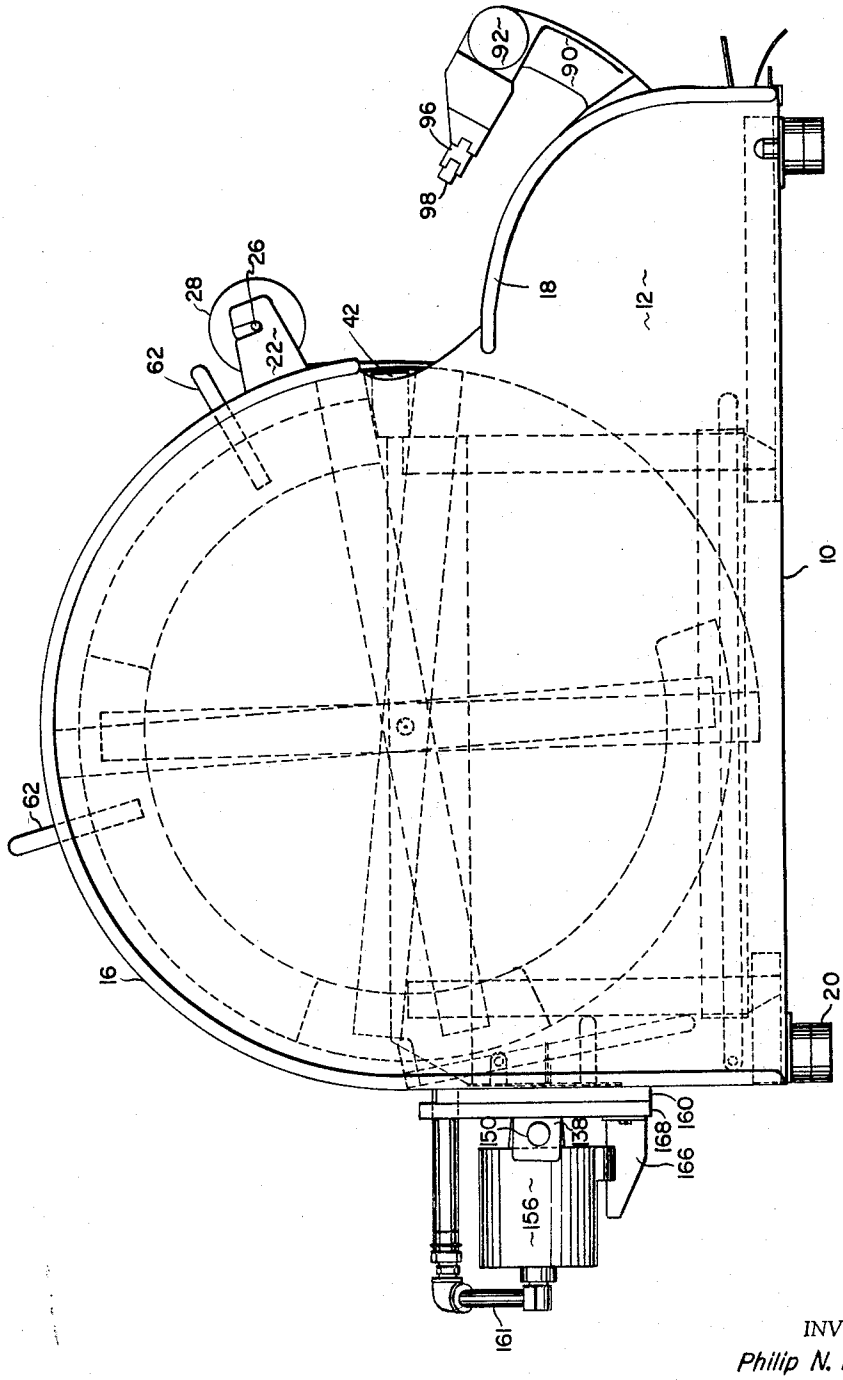


FIG. 1

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IDENTIFICATION MARKING MACHINE EMPLOYING HEATED TYPE

Filed Dec. 8, 1958 5 Sheets-Sheet 2

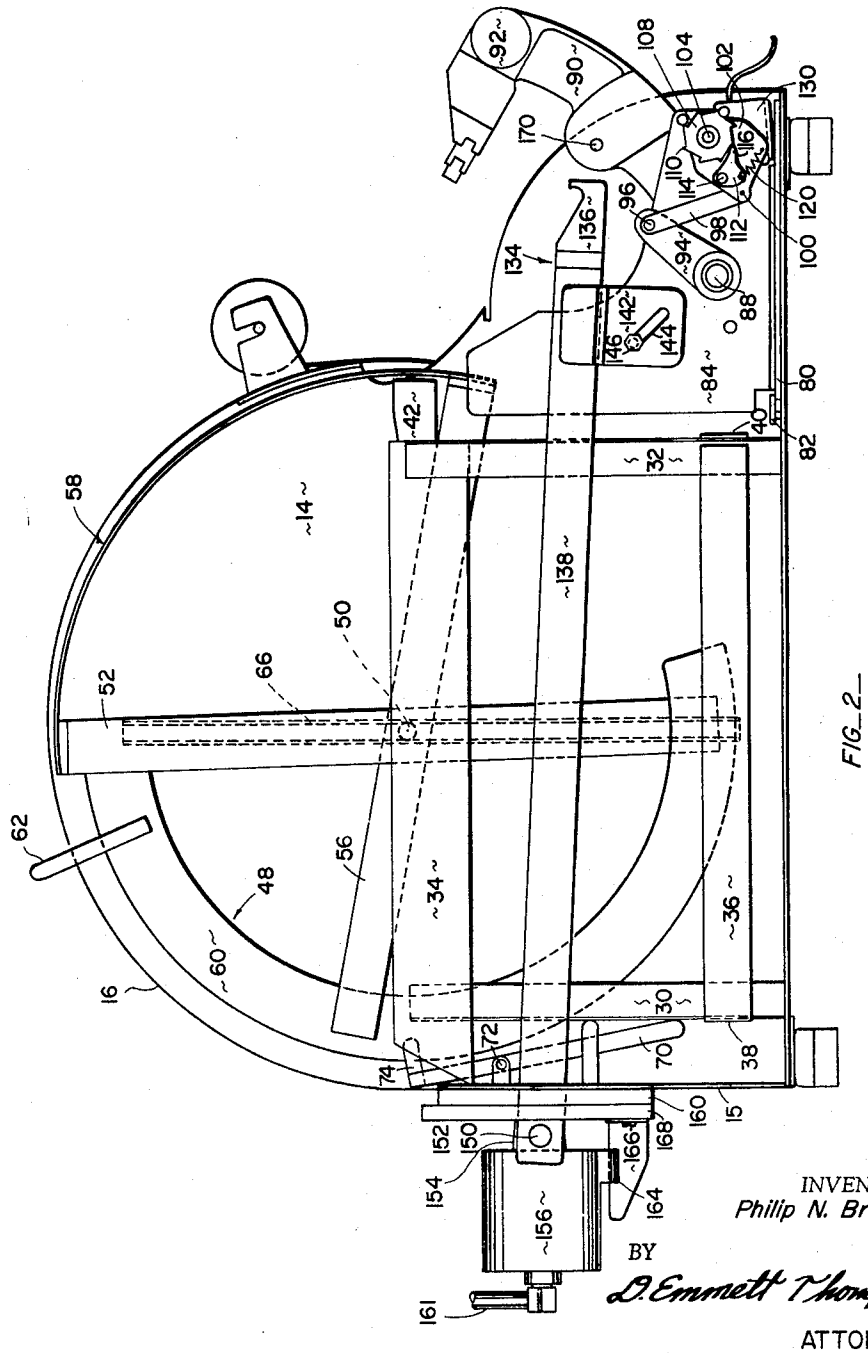


FIG. 2

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IDENTIFICATION MARKING MACHINE EMPLOYING HEATED TYPE

Filed Dec. 8, 1958 5 Sheets-Sheet 3

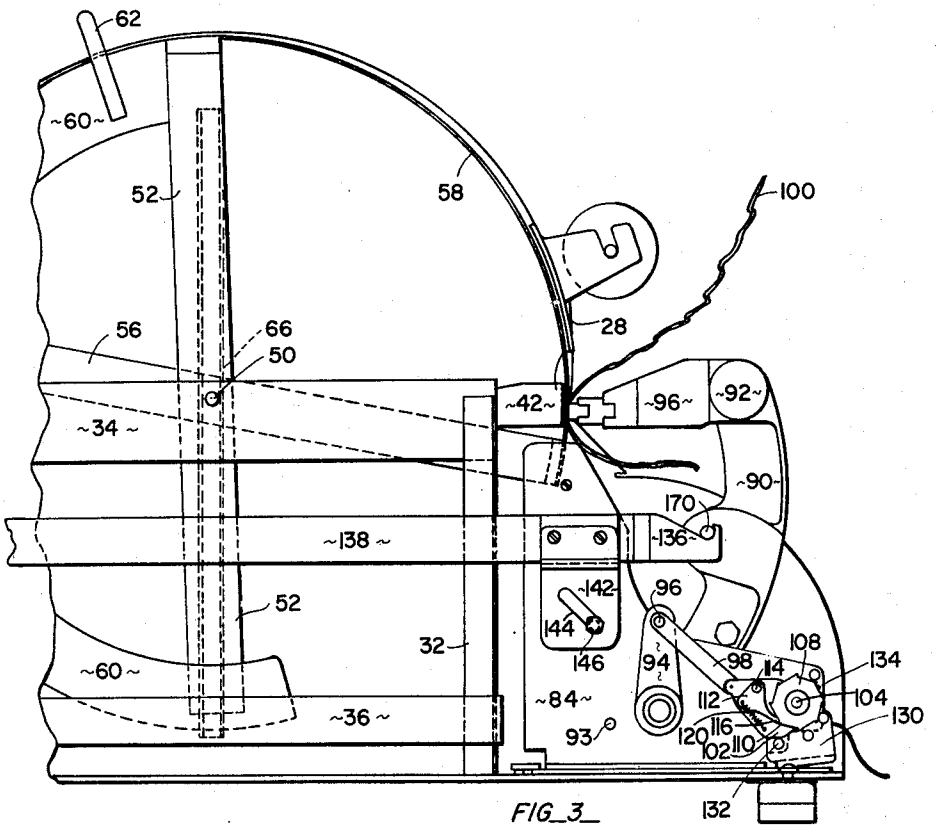
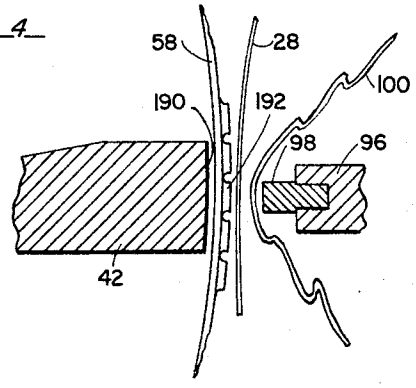


FIG_3_

FIG_4_



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IDENTIFICATION MARKING MACHINE EMPLOYING HEATED TYPE

Filed Dec. 8, 1958 5 Sheets-Sheet 4

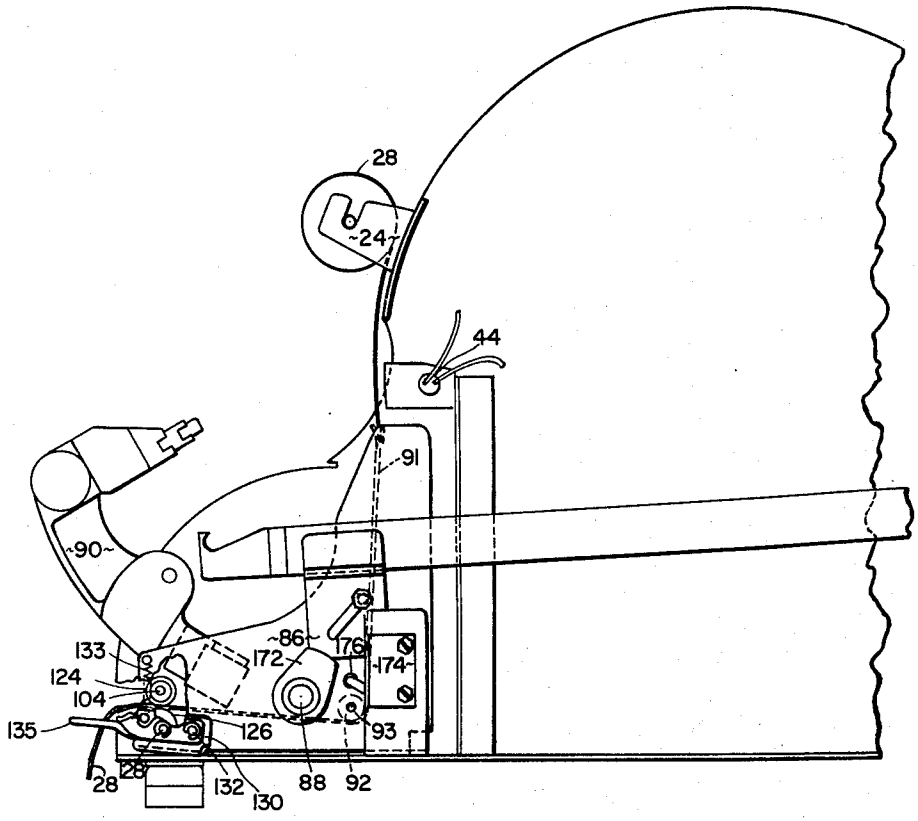


FIG_5_

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IDENTIFICATION MARKING MACHINE EMPLOYING HEATED TYPE

Filed Dec. 8, 1958 5 Sheets-Sheet 5

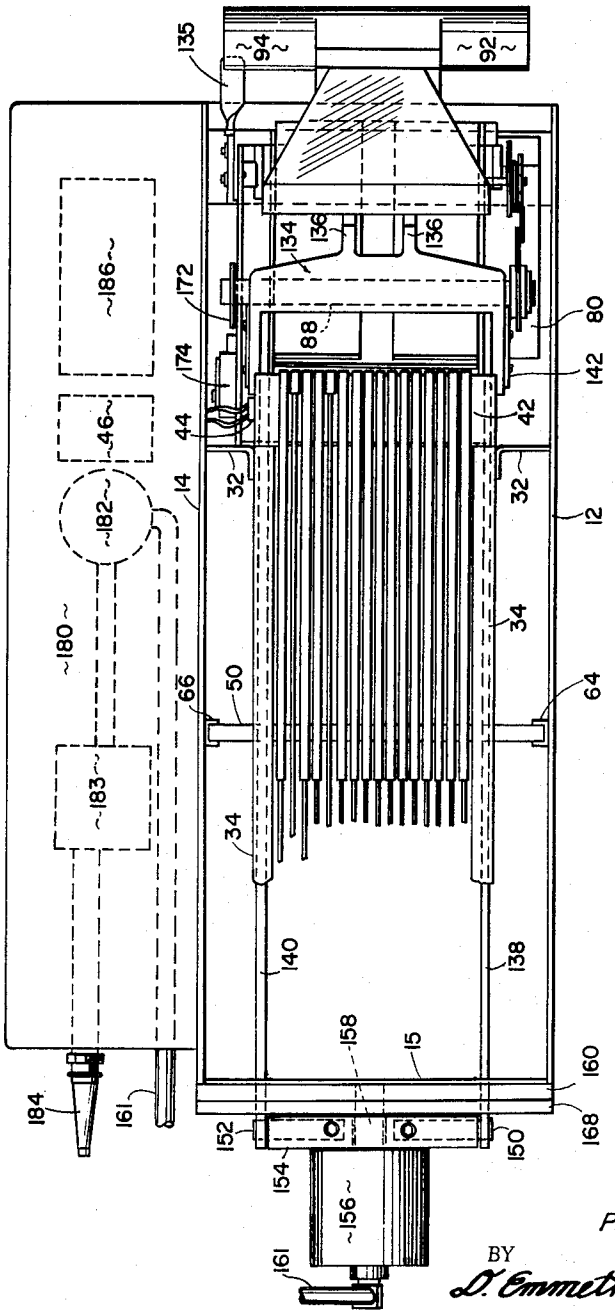


FIG_6_

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United States Patent Office

2,961,945

Patented Nov. 29, 1960

2,961,945

IDENTIFICATION MARKING MACHINE EMPLOYING HEATED TYPE

Philip N. Braun, 237 Robineau Road, Syracuse, N.Y.

Filed Dec. 8, 1958, Ser. No. 778,902

4 Claims. (Cl. 101—96)

This invention relates to and has as an object a new and improved machine for permanently marking garments and the like with identification indicia, and more particularly to such marking machines wherein the marking is applied to the garment or fabric by being printed thereon, the printing being effected by heated type.

The invention has as an object a marking machine of the type referred to embodying a novel structural arrangement of the type and type heating means, the latter being located in juxtaposition to the print line, whereby the selected type members are heated only in the area of the print line.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

In the drawings—

Figure 1 is a side elevational view of a machine embodying this invention.

Figure 2 is a view similar to Figure 1 with parts broken away.

Figure 3 is a fragmentary view similar to Figure 2 with the machine being shown in an operative position.

Figure 4 is a fragmentary cross-sectional view on an enlarged scale of a portion of the machine.

Figure 5 is a fragmentary elevational view of the opposite side of the machine to that shown in Figures 2 and 3, and

Figure 6 is a plan view with parts broken away and parts in section for purposes of clarity.

Briefly described, this invention comprises a marking machine including a housing in which a plurality of segmented arcuate type wheels are mounted for oscillation about an axis for positioning selected type characters at a print line. A heating iron is mounted in the machine at the print line and the type wheels are positioned for movement over the heating iron in heat exchanging relation thereto. The type segments are formed of a thin material having a relatively high conductivity and suitable identification indicia or characters are formed in the segments as by embossing, or the like.

A thermally responsive supply of printing tape is supported in the machine and means is provided for feeding or advancing the tape across the print line. A garment supporting platen is mounted in the machine for movement to and from the print line whereby to move the garment or material against the tape and the latter against the selected heated type for printing on the material. The tape feed means is operable to feed a fresh portion of the printing tape in juxtaposition to the print line with each successive movement of the garment platen. The machine further includes power assist means for urging the garment platen into printing engagement with the type at the print line for a predetermined period of time and under a predetermined pressure.

Referring to Figure 1, the machine is made up of a housing having a bottom **10**, side panels **12** and **14**, rear wall **15**, and a top closure **16**. The forward portion of the side panels **12** and **14** is also provided with a closure member **18**. A plurality of supporting feet **20** are carried by and depend from the bottom **10** of the housing. Mounted on the forward end of the top closure **16** by means of a pair of slotted arms **22**, **24** and a cross shaft **26** received in the arms is a roll of thermally responsive printing tape **28** to be used for a purpose to be hereinafter described.

Mounted interiorly of the housing, as best seen in Figure 2, is a frame structure including a pair of upstanding legs **30** and a pair of upstanding legs **32**. The two sets of legs **30** and **32** are affixed in spaced apart relation by a pair of upper cross braces **34**. Suitable transversely extending cross pieces **38** and **40** are affixed to the lower ends of the upstanding legs **30** and **32** and serve to fix said legs in spaced apart relation.

Heating iron **42** is mounted in any suitable manner between the upper ends of the legs **32** and is supplied with a heating element **44** and a thermally responsive switch **46** whereby the temperature of the iron **42** may be controlled. A plurality of segmented type wheels, generally indicated at **48**, are mounted on a cross shaft **50**, carried between the upper cross pieces **34**.

The type wheels **48** comprise a pair of transversely extending arms **52** and **56** affixed together at their center portions. Fixed to the outer ends of the arms **52** and **56** is a thin arcuate type segment **58** formed of a material having a high head conductivity such as brass, or the like. A semi-circular segment **60** is affixed to the opposite ends of the cross arms **52** to counterbalance the type segment **58** and the opposite end of cross arm **56** is fixed to the semi-circular piece **60** intermediate its ends, see Figure 2. Adjacent the end of the cross arm **52** to which the type segment **58** and the counterbalance piece **60** are fixed is a radially extending finger tab grip **62** which extends through a suitable arcuate slot formed in the top closure **16**.

The type wheels **48** are mounted for oscillation on the cross shaft **50** and the outer ends of the cross shaft **50** which extend through the arms **34** are received in a pair of upstanding channel members **64** and **66**, carried by the side walls **12** and **14** of the housing. As best seen in Figures 2 and 3, the type segments **58** pass over the face of the heating iron **42** in heat exchanging relation with the iron for a purpose to be hereinafter described.

The top closure **16** is provided adjacent the slots through which the finger tabs **62** extend with scales which are formed with indicia similar to the indicia formed on the type segments **58** and the scales are calibrated whereby the position of the finger tab **62** adjacent the scale will indicate the indicia on the particular segment **58** which is positioned centrally of the face of the heating iron **42**. It will be understood that in this manner the plurality of type wheels **48** carried in the housing may be selectively positioned with respect to the heating iron **42** to present a type line in juxtaposition to the face of the heating iron **42** and the indicia forming this print line may be changed at will by the operator of the machine.

Suitable detent mechanism including a detent arm **70** pivoted about pivot point **72** having a finger **74** engaging the portion **60** of the type wheel **48** is positioned in the rear of the housing to insure that the plurality of type wheels are stopped in the correct position with the identification indicia formed on the type segments **58** in alignment in order to present a print line to the face of the heating iron **42**. This detent mechanism may be of the type disclosed in the patent to Petermann et al.,

2,598,438, issued on May 27, 1952. As will be obvious, upon removal of the top closure **16** the entire type wheel mechanism may be removed from the housing by sliding the cross shaft **50** upwardly out of the upstanding channel members **64** and **66**.

Mounted in the forward portion of the housing on the base **10** is a frame having a base plate **80** which is removably mounted in the bottom of the housing by means of a pair of upstanding shouldered pins **82**. The frame includes side walls **84** and **86** and a main cross shaft **88** is mounted between the side walls **84** and **86**. Platen carrying arm **90** is fixed to the cross shaft **88** for oscillation in the frame between the side walls **84** and **86**. The upper end of the arm **90** is formed with a pair of side extensions **92** and **94** which serve as handles to oscillate the arm **90**. Adjacent the upper end of the arm **90** and the handles **92** and **94** is mounted a platen **96** having a resilient face **98** over which a garment **100** may be draped for movement into engagement with the tape **28**, type segments **58** forming the type line, and heating iron **42**.

Mounted between the inner ends of the sides **84** and **86** is a slotted L-shaped tape guide **91** which receives and guides the tape **28** over the iron **42** and in spaced relation outwardly from the iron **42**. It is necessary to position and guide the tape **28** outwardly from the iron **42** in order to prevent the heat of the iron from causing the printing ink on the tape **28** from becoming fluid.

A lower idling guide roll **92** is carried on a shaft **93** mounted in the lower end of the frame between the side plates **84** and **86** and serves to guide the tape **28** through the frame as it emerges from the vertical leg of the tape guide **91**.

Fixed to the outer end of the main cross shaft **88** adjacent the side plate **84** is an arm **94**. The arm **94** at its outer end is pivotally connected as at **96** to a link **98** which in turn is pivotally connected as at **100** to a plate **102**. The plate **102** is journaled for oscillation on a cross shaft **104** carried between the outer forward portions of the side plates **84** and **86**. Fixed to the outer end of the shaft **104** for rotation therewith is a ratchet wheel **108** formed with a plurality of teeth **110**. A pawl **112** is pivotally mounted on the plate **102**, as at **114**, and the pawl is formed with a point **116** which is urged into engagement with the teeth **110** of the ratchet wheel **108** by means of a tension spring **120**. As will be obvious upon upward movement of the arm **90** from the position shown in Figure 2 to the position shown in Figure 3, the pawl **112** will slide over one tooth **110** of the ratchet wheel **108** and upon downward movement of the arm **90** from the position shown in Figure 3 to the position shown in Figure 2 the spring **120** will urge the point **116** of the pawl **112** into engagement with the tooth **110** on the ratchet wheel **108** thus causing a partial rotation of the shaft **104**.

Referring now to Figure 5 a friction feed wheel **124** is affixed to cross shaft **104** intermediate the side plates **84** and **86**. The tape **28**, as it emerges from the horizontal leg of the tape guide **91**, passes between the feed wheel **124** and an idler wheel **126** carried by a cross shaft **128**. The outer ends of the cross shaft **128** are affixed to the legs of an outwardly extending yoke **130** having its legs pivotally mounted to the frame sides as at **132**. The yoke **130** is urged upwardly by means of the tension spring **133** to urge the shaft **128** and in turn the idler wheel **126** into engagement with the tape **28** and the feed wheel **124**.

When the feed mechanism, previously described, causes a partial rotation of the shaft **104** the feed wheel **124** will in turn engage the tape **28** positioned between the feed wheel **124** and the idler wheel **126** and cause the tape **28** to be fed forwardly or to the left, as seen in Figure 5, out of the machine. If it is desired to manually pull the tape out of the machine, the finger portion **135** of the yoke **130** is depressed to move the yoke **130**, cross shaft **128** and idler wheel **126** downwardly out of engagement with the tape **28** thus permitting the tape to be manually pulled through the machine between the feed wheel **124** and the idler wheel **126**.

As will be also obvious, the tape feed mechanism just described functions on the downward or return stroke of the platen arm **90** whereby a fresh portion of the tape **28** is fed downwardly past the iron **42** in juxtaposition with and in outwardly spaced relation to the iron to permit the next printing operation on the garment **100**.

Power assist means are provided for assisting the printing operation and comprises a yoke member, generally indicated at **134** formed with a pair of forwardly extending hooks **136** and a pair of rearwardly extending legs **138** and **140**. Each of the legs **138** and **140** is provided adjacent its forward end with a plate **142** having a cam slot **144** mounted on pins **146** carried by the frame sides **84** and **86**. The rearward ends of the legs **138** and **140** of the yoke member **134** are fixed to a pair of pins **150** and **152** which extend outwardly from a cross block **154** carried by a fluid operated cylinder **156**. The piston rod **158** of the cylinder **156** extends through block **154** and is fixed to a plate **160** mounted on the rear end wall **15** of the housing whereby upon introduction of fluid pressure into the cylinder **156** through the line **161** the cylinder **156** will move outwardly with respect to the plate **160** thus moving the legs **138** and **140** of the yoke **134** rearwardly, as viewed in Figure 2. The cylinder **156** is formed with a slotted depending ear **164** which is mounted on a rail **166** carried by a plate **168** affixed to plate **160** to guide the rearward movement of the cylinder **156**.

The rearward movement of the legs **138** and **140** of the yoke member **134** causes the hooks **136** to be moved rearwardly or to the left, as viewed in Figure 2 and upwardly by reason of the movement of the cam slot **144** on the pin **146**. Formed intermediate the ends of the platen arm **90** is a cross pin **170**. As the arm **90** is moved upwardly toward the heating iron **42**, the pin **170** is positioned to be engaged by the hooks **136** of the yoke member **134**. When the cylinder **156** is actuated, in a manner next to be described, upon movement of the arm **90** into proximity with the heating iron **42**, the movement of the yoke member, just described, causes the hooks **136** to engage the cross pin **170**, thus moving the arm **90** and the resilient face **98** of the platen **96** inwardly into engagement with the printing tape, print line, and heating iron to effect the printing or marking operation on the garment **100**, as best seen in Figure 3.

Actuation of the cylinder **156** as the arm **90** is moved into proximity to the iron **42** is effected in the following manner. Referring to Figure 5, a switch actuating arm **172** is mounted on the end of the main cross shaft **88** adjacent the side wall **86**. A micro-switch **174** having an actuator **176** is mounted on the side plate **86** adjacent the arm **172**. As the arm **90** is moved upwardly to the right, as viewed in Figure 5, to effect the printing operation, the arm **172** which is fixed to the shaft **88** will be rotated in a clockwise manner and will engage the actuator **176** of the micro-switch **174** when the arm **90** is moved into close proximity to the heating iron **42**. The micro-switch **174** is connected in a conventional circuit and serves to energize a solenoid actuated valve to permit the introduction of fluid pressure into the cylinder **156** through the line **161**.

Referring to Figure 6, a control compartment **180** is formed adjacent to the main housing and the solenoid actuated valve just described is indicated at **182** and is connected in line **161** through a pressure regulator **183** to an extended fluid pressure coupler **184**. Also mounted in the control housing **180** is a timing mechanism **186**. These control elements comprise part of the control circuit and serve to permit the garment to be urged into engagement with the printing tape, at the print line, for a predetermined period of time and with a predetermined pressure, whereby the desired printing operation may be effected. A suitable compression spring, not shown, is mounted in the cylinder **156** and serves to

return the cylinder and yoke member **134** to their normal position, shown in Figures 1 and 2, after the printing operation has been effected. Thereupon, the operator may move the garment platen outwardly to normal rest position.

Referring now to Figure 4 wherein a portion of the heating iron **42** and one of the plurality of type segments **58** has been shown on an enlarged scale, it will be seen that the face **190** of the heating iron is formed with a curvature having a radius identical to the radius of the type segment **58**, whereby the type segments engage the face **190** of the iron **42** in heat exchanging relation thereto. Formed on the type segments **58** by embossing, or any other suitable method are a plurality of identification characters, generally indicated at **192**. The over-all thickness of the type segment **58** is approximately 15 thousands of an inch and, as previously set forth, the segments **58** are formed of a material having a high heat conductivity whereby that portion of the segment in engagement with the face **190** of the heating iron is quickly heated as it is moved into engagement with the face **190**. The identification indicia **192** forming the print line, suitably positioned by the detent apparatus previously described, are consequently quickly heated by the iron **42** so that, upon movement of the garment **100** and resilient face **98** of the platen **96** into engagement with the tape **28**, the heat of the indicia **192** will render the printing ink sufficiently fluid in order to properly effect the desired printing operation.

As the various segments **58** are oscillated to form successive print lines having different identification indicia, these print lines will be quickly heated, as just described, so that no time lag is necessary to permit heating of the print line in order to effect the printing operation. At the same time, however, the over-all temperature of the machine is held to a minimum due to the fact that only those portions of the type segments immediately adjacent the print line are heated rather than the entire segments.

In operation, a garment is placed over the resilient face **98** of the platen **96**, which is carried by the arm **90** and positioned in the rest position, shown in Figure 1. The arm **90** is then grasped by the handles **92** and **94** and moved in a counterclockwise direction, as viewed in Figure 1, toward the heating iron **42**. As the arm **90** moves into close proximity to the iron **42** the arm **172** closes the micro-switch **174** which causes the hooks **136** of the yoke member **134** to engage the cross pin **170** on the arm **90** and move the garment and platen into engagement with the printing tape **28** and the print line formed by the type segments **58** to effect the printing operation, as seen in Figure 3. After the garment **100** remains in engagement with the printing tape, print line, and heating iron for the predetermined amount of time, the compression spring in the cylinder **156** functions to return the yoke member and hook **136** to its normal position, thereby permitting the arm **190** to be returned under the influence of gravity to its rest position, as seen in Figure 1.

It will be seen that by my invention I have provided a marking machine for permanently marking garments, or the like, wherein the print type are heated only at the print line.

What I claim is:

1. A machine for marking garments and the like with identification indicia comprising a housing, a plurality of segmented type wheels mounted in said housing for movement about a common axis, a heating iron mounted in the housing, said type wheels including thin arcuate type segments movable over said iron in heat exchanging relation thereto, said type segments each having a plurality of print type characters formed therein to present selected type at a print line in juxtaposition over said iron upon selective movement of said type wheels about said axis said iron forming a backing member for said type segments, a roll of printing tape coated with a thermally responsive printing medium carried by said machine, means for guiding said tape over and in outwardly spaced relation to the type at said print line, a garment platen mounted in said machine, means operable to effect relative movement between said type and said platen for imprinting on a garment supported by said platen, and tape, feed means for feeding said tape past said print line in response to said relative movement between said type and platen.

2. A machine for marking garments and the like with identification indicia comprising a housing, a plurality of segmented type wheels mounted for oscillation in said housing, a heating iron carried in said housing, means for heating said iron, said type wheels including thin arcuate type segments mounted for movement over said iron in heat exchanging relation therewith, said type segments having a plurality of identification indicia formed therein and combining to present a type line in juxtaposition over said iron said iron forming a backing member for said type segments, a roll of printing tape coated with a thermally responsive printing medium carried by said machine, said tape being guided over said iron in spaced relation to the type line formed by said type segments, a garment platen mounted in said machine for movement to and from said iron to effect a printing operation, a tape feed means for feeding said tape past said printing line in response to movement of said garment platen.

3. Claim 2, wherein said thin arcuate type segments are formed of a material having relatively high heat conductivity and wherein said segments engage the face of said heating iron whereby upon movement of a new portion of said segment into engagement with said iron said portion will be rapidly heated.

4. A garment marking machine comprising a frame, a garment supporting platen mounted for movement to and from a heating iron having a relatively small effective heating face mounted in said machine, a plurality of type segments mounted in said machine in heat exchanging relation with said iron, said type segments being formed of thin arcuate strips having high conductivity and being individually movable over said heating iron said iron forming a backing member for said type segments to form a type line juxtaposed on said heating iron, a supply of thermally responsive printing tape carried by said machine, a tape guide for guiding said tape from said supply over said iron and type line in spaced relation thereto, feed means operable upon retrograde movement of said garment supporting platen to feed said tape past said type line to present a fresh printing surface of tape to said type line for each successive printing operation, and means including a reciprocating yoke member for automatically engaging and urging said garment platen into engagement with said type line when said platen is moved into proximity to said type line.

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UNITED STATES PATENT OFFICE

CERTIFICATION OF CORRECTION

Patent No. 2,961,945 November 29, 1960

Philip N. Braun

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 12, after "tape" strike out the comma; lines 47 and 48, strike out "said iron forming a backing member for said type segments"; line 49, after "iron," insert -- said iron forming a backing member for said type segments, --.

Signed and sealed this 23rd day of May 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents