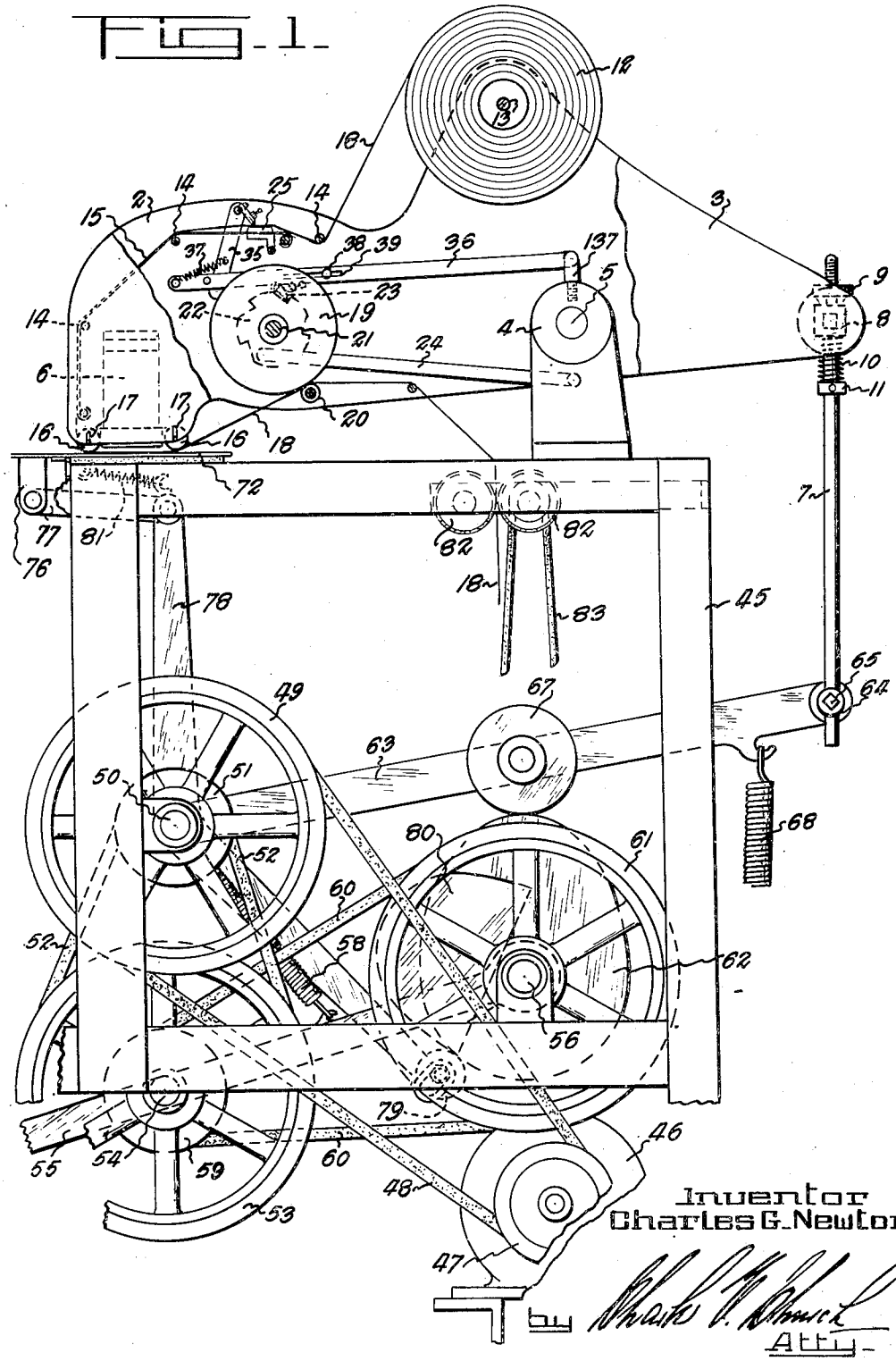
Oct. 18, 1949. C. G. NEWTON 2,484,901

MACHINE FOR APPLYING TRANSFERS

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Fig. 1.

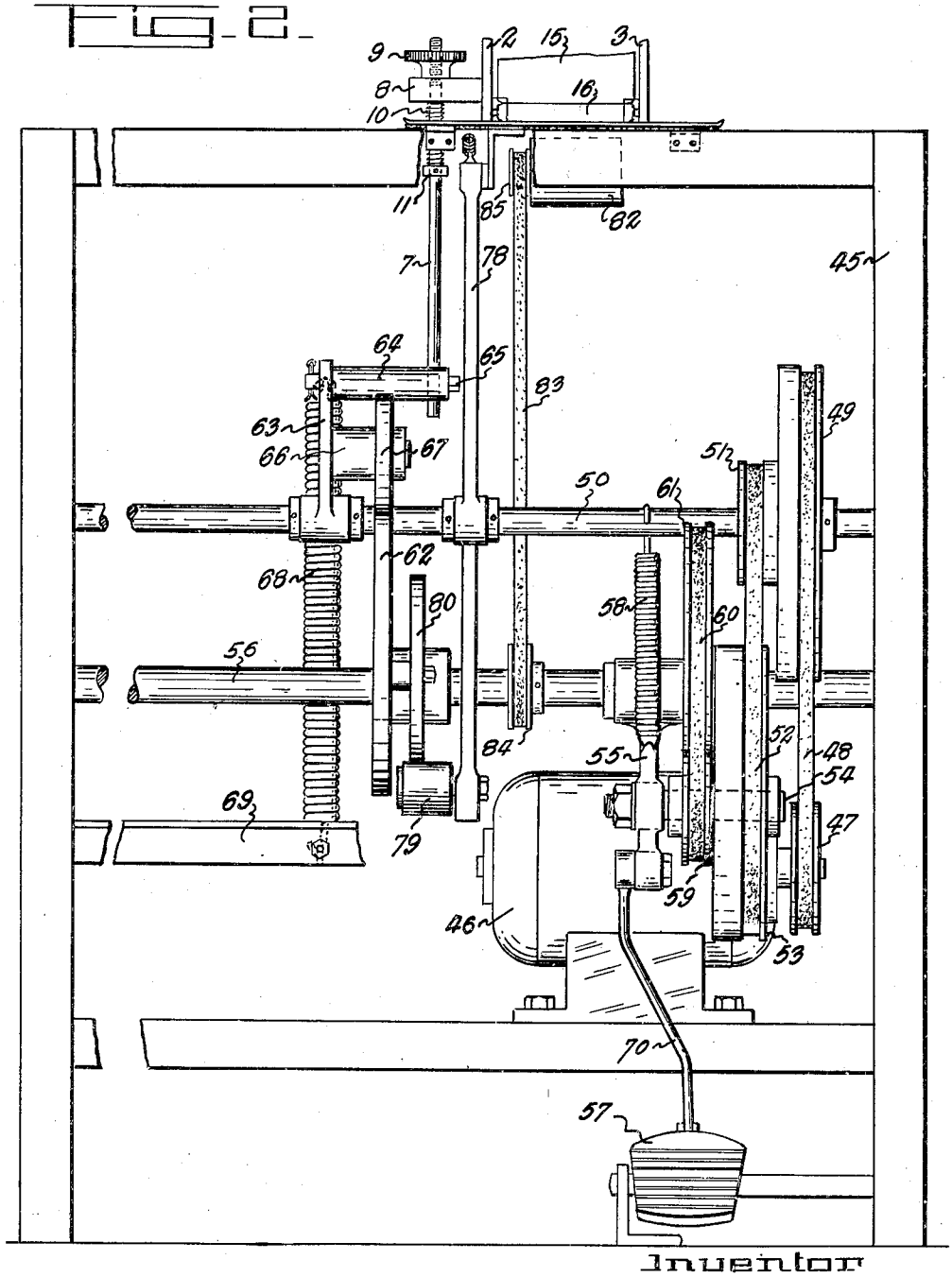


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Fig. 2.



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Fig. 3.

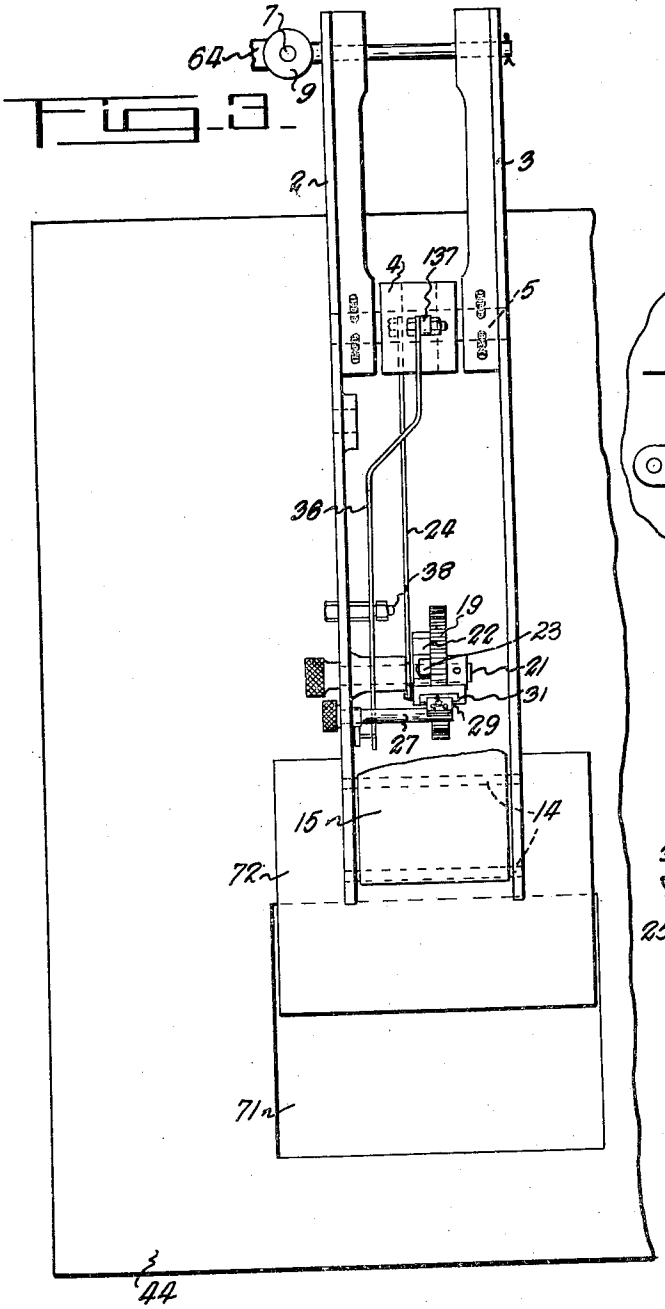


Fig. 4.

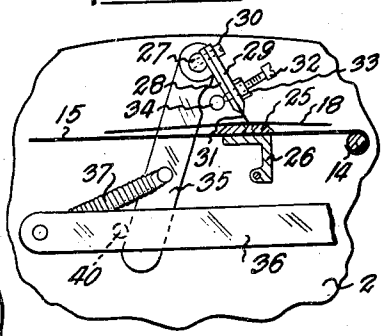
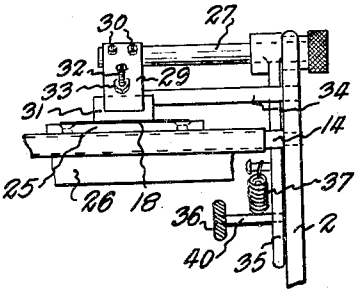


Fig. 5.



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Fig. 6.

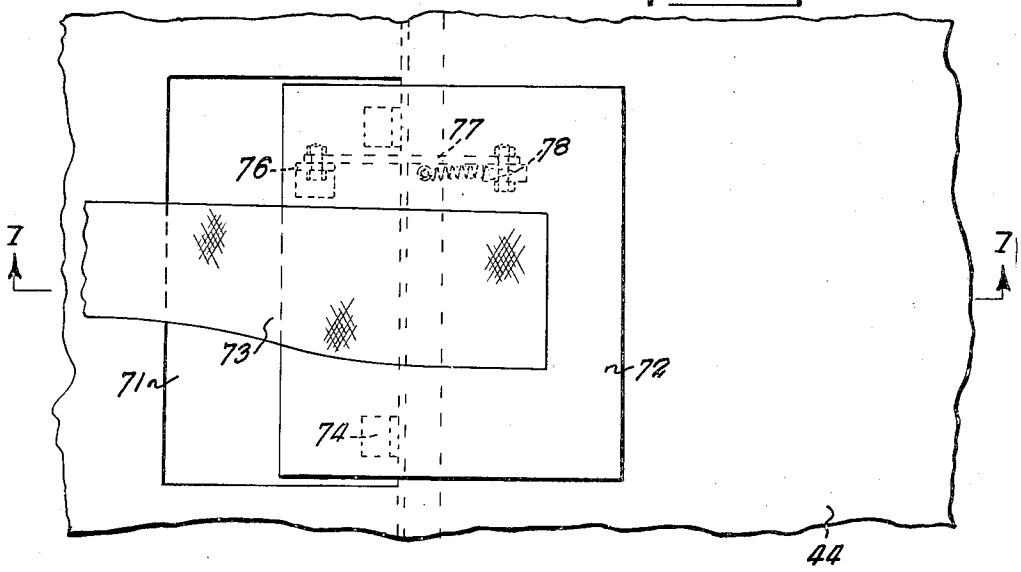
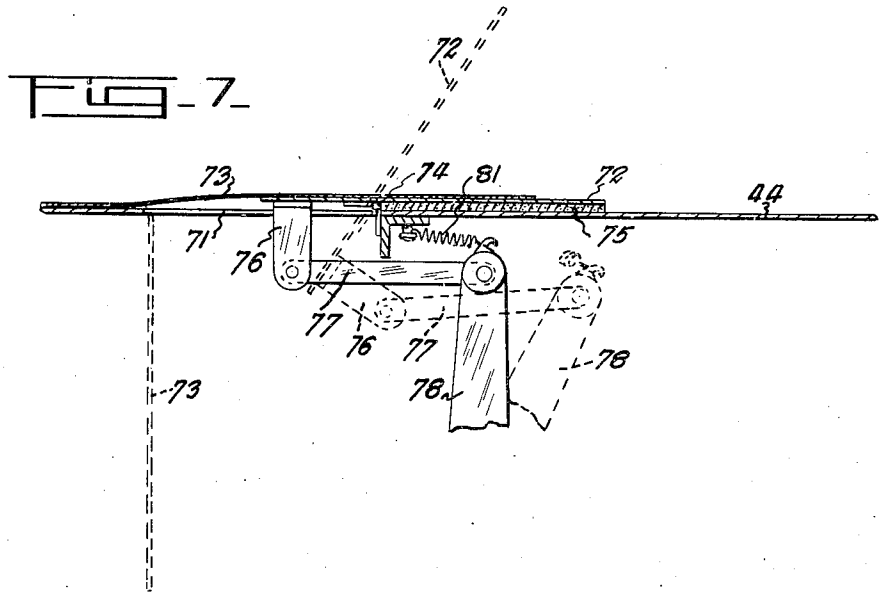


Fig. 7.



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FIG. 8.

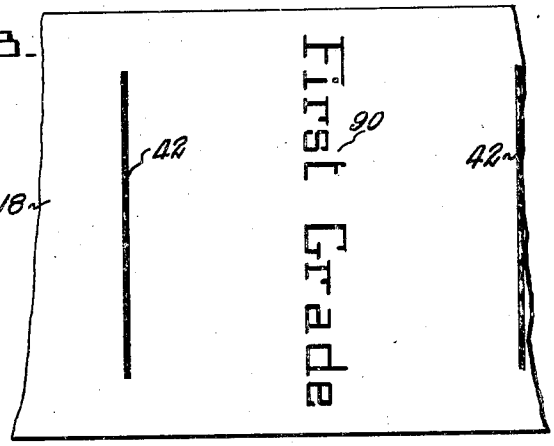


FIG. 9.

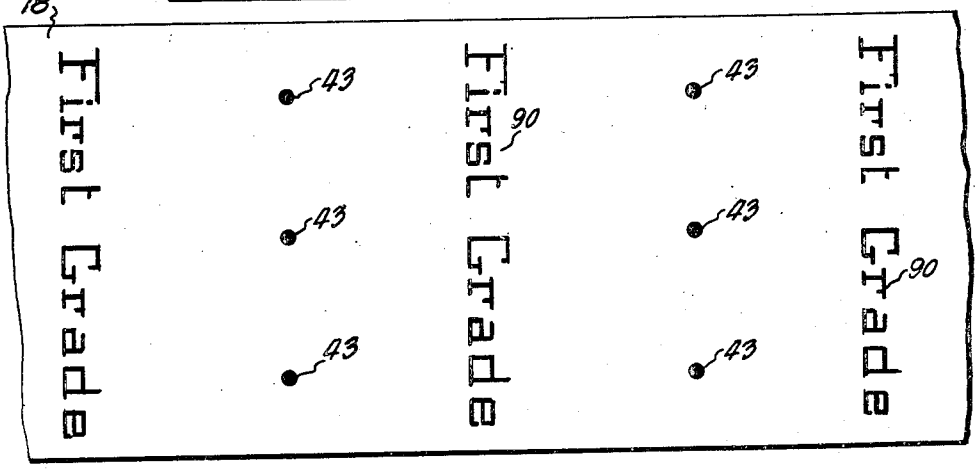
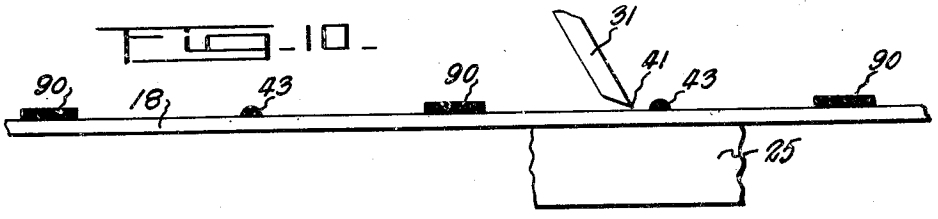


FIG. 10.



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UNITED STATES PATENT OFFICE

2,484,901

MACHINE FOR APPLYING TRANSFERS

Charles G. Newton, Hamilton, Ontario, Canada

Application September 4, 1945, Serial No. 614,275

7 Claims. (Cl. 41—1.2)

1

My invention relates to new and useful improvements in machines or devices for impressing transfers upon articles of clothing, such as stockings, sox, and the like, and the object of my invention is to devise a machine whereby a paper tape having a series of transfer emblems thereon is intermittently fed through the machine so that the emblems are successively brought into registration with a heating element to be impressed upon the article being stamped.

Paper tape has been used for many years in various machines for imprinting emblems upon wearing apparel through the application of heat and pressure, but in most of such machines great difficulty has been encountered in getting the spaced-apart emblems on the tape to continuously register with the face of the heating element as the tape passes thereover. This is due to unavoidable variations in paper thickness which cause either binding or slippage between the tape and the actuating mechanism with the result that the emblems are very often out of register with the heating element.

A very particular object of my invention is to overcome the before-mentioned difficulty and I attain the desired result by the provision of a moveable blade-like member which intermittently rests against the face of the moving tape and momentarily engages the edge of each embossed emblem whereby the tape is brought to a standstill in such a position that one of the preceding emblems is in register with the heating element.

Another and important object of my invention is to incorporate a tilting tray in my machine and upon which the article to be stamped rests; the tilting movement of the tray being synchronized with the movement of the heating element whereby the tray tilts after the article has been stamped, so that the stamped article drops downwardly and the tray upon returning to its horizontal position is ready to receive the next article to be stamped.

With the foregoing and other objects in view, as shall hereinafter appear, my invention consists of a machine for impressing transfers on articles of apparel all as hereinafter more particularly described and illustrated in the accompanying drawings in which—

Figure 1 is a side elevational view of my machine, the upper oscillatable heating element and tape-carrying arm being partly broken away to disclose the interior thereof, the front part of the bench upon which the articles of apparel rest not being shown.

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Figure 2 is a front elevational view of the operating mechanism as shown in Figure 1.

Figure 3 is a plan view of the machine, the roll of tape being removed from the oscillatable arm, and one end of the supporting bench being broken away.

Figure 4 is an enlarged side elevational view of the knife blade assembly through which the tape passes and which controls the movement of the tape.

Figure 5 is a front elevational view of the assembly shown in Figure 4.

Figure 6 is an enlarged plan view of the fragmentary portion of the bench showing the tilting tray carried thereon.

Figure 7 is a vertical sectional view taken through the line 7—7, Figure 6.

Figure 8 is a plan view of a piece of the embossed emblem paper tape showing the provision of a line character embossed upon the tape adjacent to an emblem.

Figure 9 is a similar view to Figure 8 showing dot characters embossed upon the tape between the emblems in place of the line character shown in Figure 8, and

Figure 10 is a highly magnified view of the edge of the tape showing the embossed emblem and also the embossed line or dot character thereon, the character being about to be engaged by the registering blade, as shall be hereinafter described.

Like characters of reference indicate corresponding parts in the different views of the drawings.

The emblem-imprinting portion of my machine comprises a swingable arm consisting of a pair of spaced apart side members 2 and 3 which are pivotally mounted upon a boss 4 positioned therebetween. A spindle 5 extends between the sides 2 and 3 and is rotatably contained within the boss 4. A heating element or iron 6 is positioned between the forward ends of the sides 2 and 3 and the arm is swung about the spindle 5 through the medium of a connecting rod 7 which extends downwardly from the rear end of the arm. The upper end of the rod 7 freely extends through a shoulder 8 and is threaded to carry a nut 9 bearing against the upper face of the shoulder. A spring 10 is interposed between the lower face of the shoulder and a collar 11 on the rod 7. As the rod 7 is pulled downwardly, the forward end of the arm assembly swings upwardly and as the rod is moved upwardly the forward end of the arm swings downwardly to bring the heating element and trans-

fer into contact with the garment being stamped. By the provision of the spring 10 interposed between the lower face of the shoulder 8 and the collar 11, the rod 7 can be so adjusted that the spring 10 is compressed somewhat as the heating element on the front end of the arm contacts the garment, thus providing an even and uniform pressure irrespective of the thickness of the garment.

The paper-tape carrying the embossed emblems is in roll form 12 positioned between the side members 2 and 3 on a spindle 13. The free end of the roll is carried forwardly and downwardly between the sides 2 and 3 over a plurality of rods 14 which extend between the side members 2 and 3. A thin flexible metal plate 15 is carried over a number of the rods 14 and upon which the tape slides.

A pair of rollers 16 are positioned between the side members 2 and 3 on either side of the bottom of the heating element 6. The spindles of the rollers are slidable within vertical slots 17, the spindles of the rollers riding in the bottoms of the slots due to the weight of the rollers. When the rollers are in this position their bottoms are in a lower plane than the bottom of the heating element 6 and as the paper tape 18, passing from the roll 12, is carried over the rollers 16, it is also spaced away from the face of the hot heating element. When the forward end of the arm assembly swings downwardly into position to stamp the garment, the spindles of the rollers 16 will move upwardly in the slots 17 under the downward pressure of the arm assembly whereby the face of the heating element 16 will come into contact with the tape 18 and press the emblem against the garment being stamped.

The tape 18 upon passing across the face of the heating element 6 passes between a pair of rollers 19 and 20 which function to draw the tape from the roll 12 across the heating element. The roller 19 is intermittently rotated and the roll 20 is free and can be adjusted in pressure against the tape 18 and roller 19. The roller 19 is carried upon a spindle 21. A ratchet wheel 22 is also mounted upon the spindle 21 and is positioned beside the roller 19. A spring actuated pawl 23 is secured to the side of the roller 19 and is adapted to engage with the ratchet wheel 22. A lever 24 extends from the boss 4 to the side of the lower portion of the ratchet wheel 22, being pivotally connected to the boss and the ratchet wheel. When the arm assembly is swung upwardly, through the downward pull of the rod 7, the arm 24, swinging about a lower centre than the centre of the spindle 5 about which the arm assembly swings, will move the ratchet wheel 22 in a counter-clockwise direction. As the pawl 23 on the side of the roller 19 is in engagement with one of the teeth of the ratchet wheel 22, the roller 19 will also rotate in a counter-clockwise direction. This rotation of the roller 19 will continue until the arm assembly reaches the limit of its upward swing. As the arm assembly swings downwardly the ratchet wheel will rotate in a clockwise direction and the pawl 23 will disengage from the teeth of the ratchet wheel 22 and the roller 19 will remain stationary. It will thus be perceived that during each upward swing of the arm assembly the roller 19 will have a certain degree of movement and will, consequently, intermittently draw the tape 18 across the face of the heating element 6.

Due to unavoidable varying thicknesses of the paper tape it is not possible to depend upon the intermittent movements of the roller 19 to exert a uniform pull upon the tape and draw it a predetermined distance across the face of the heating element 6. If there is a thick portion of the paper tape passing between the rollers 19 and 20, there will be no slippage at that point, but, if a thin spot on the paper tape passes between the rollers 19 and 20, there will be a certain amount of slippage which when carried over a number of intermittent movements of the roller 19 may cause the emblems to completely move out of register with the face of the heating element 6. In order to ensure that the transfer emblems will register with the heating face of the element at all times, I provide my emblem engaging blade device which I now describe.

My emblem registering device, as illustrated in Figures 4 and 5, comprises a plate or anvil member 25 which is positioned between the side members 2 and 3 of the arm assembly in the path of the travel of the tape 18 as it leaves the roll 12. The plate 25 is positioned above the paper guide plate 15 and is supported by an angle bracket 26 extending transversely from the side member 2. The paper upon leaving the roll 12 passes underneath the first spindle 14 and across the top of the anvil plate 25, also shown in Figure 1. A horizontal rod 27 is journalled within the side member 2 and projects over the anvil plate 25. The blade carrying assembly is secured to the end of the rod 27 and consists of a pair of plates 28 and 29 which are secured to the rod 27 by screws 30. A blade 31 is secured between the lower ends of the plates 28 and 29 by a screw 32 which freely passes through the plate 29 and is threaded into the plate 28. A lock nut 33 is carried upon the screw 32 to bear against the plate 29 whereby the plates are drawn together to clamp the blade 31. The end of the screw 32 projects through the plate 28 and its end is adapted to contact a pin 34 whereby the turning movement of the rod 27 and the downward swing of the plate and blade assembly can be limited and adjusted as such movement is halted when the end of the screw 32 comes into contact with the pin 34.

To actuate the swinging movement of the plate and blade assembly an arm 35 is secured to the rod 27, extending downwardly therefrom. A lever 36 is pivoted at one end to a lug 137 carried upon the top of the boss 4 and has its other end extending past the lower end of the arm 35. The arm 35 and lever 36 are connected to a spring 37 and the lever 36 is supported in its substantially horizontal position by a pin 38 projecting inwardly from the side member 2 and passing through a slot 39 in the lever. A knob 40 is carried by the lever 36 and is adapted to contact the side of the arm 35.

When the swingable arm assembly, as shown in Figure 1, is swung upwardly through the downward pull of the rod 7, the lever 36, which is pivoted on the lug 137 of the boss 4, will also swing about that point and as its pivotal point is above the centre of swing of the arm assembly it will move outwardly and exert a tension upon the spring 37. The spring 37 will, therefore, have a tendency to swing the arm 35 in a clockwise direction, thus swinging the blade 31 downwardly into contact with the paper tape.

During the upward movement of the arm assembly the roller 19 will move in a counter-clockwise direction to pull upon the tape 18, as previously described. The mechanism is so designed

and synchronized that the blade will come into contact with the tape before the movement of the tape under the pull of the roller 19 is completed.

Transfer paper tape as is in common use in the marking of articles of clothing has its emblems printed thereon in a type of ink which when subjected to heat and pressure leaves the paper to be transferred to the article. The transfer emblems are inked quite thickly upon the paper tape and are, in fact, what might be well described as "embossed." In Figures 8, 9 and 10, I show enlarged views of paper tape with embossed emblems, and in the magnified view in Figure 10 I show the embossing standing up a sufficient height from the face of the paper so that it is engageable by the lower edge 41 of the blade 31. As the tape 18 is being drawn over the anvil plate 25 with the edge 41 of the blade 31 resting upon the upper surface of the paper, the edge of the blade will contact the first emblem 90 approaching it with sufficient surety to stop the movement of the tape. The contact between the blade edge and the emblem is arranged to occur just before the tape pulling roller 19 comes to a standstill. The pressure between the rollers 19 and 20 pulling upon the tape 18 is so arranged that as soon as the movement of the paper tape is stopped through the contact of the blade with an emblem the rollers will slip without tearing the tape. The length of tape between the blade 31 and the face of the heating element is so arranged that when the blade 31 is in contact with an emblem that one of the other emblems which has already passed the blade 31 will be in register underneath the face of the heating element 6.

When the arm assembly swings downwardly to impress the transfer emblem underneath the element 6 onto the article to be stamped, the lever 36 will have a retroactive movement wherein the tension will be taken off the spring 37 and the knob 40 on the lever 36 will come into contact with the side of the arm 35 and swing such arm and blade assembly in a counter-clockwise direction whereby the edge 41 of the blade 31 will be lifted from out of contact with the side edge of the emblem. As previously explained, the roller 19 will be stationary during this movement as will also be the tape. When the arm assembly commences to swing upwardly to repeat the procedure, the roller 19 will move and pull the tape 18 prior to the blade 31 being swung downwardly to re-contact the tape so that the emblem previously contacted by the blade will have an opportunity to slide thereunder before the blade re-contacts the tape to engage the next emblem.

As in many cases transfer emblems are of quite an intricate design and do not present a straight edge across the letters of the emblem design which can be uniformly contacted by the blade edge, I propose to use a very effective and yet simple method for stopping the travel of the tape and embodying the same principle as my invention. In Figure 8, I show bar characters 42 embossed upon the tape between the emblems, and in Figure 9, I show corresponding aligned dot characters 43 embossed upon the tape between the emblems. These characters can be readily embossed upon the tape at the same time as the emblems are printed or embossed and are provided so that they will be contacted by the blade 31 instead of the blade contacting the emblems. The bars or aligned dots will always present a uniform side surface to the edge of the blade and there will be no possibility of the emblems being pulled underneath or being shorn off by the blade as they come into contact therewith. In the case of certain designs where the tops of some letters are higher than others, there is the possibility that the edge of the blade may occasionally shear the tops of the letters in the emblem and thus not bring the tape to a standstill at exactly the same point in each stamping operation.

In order to swing the heating element and tape carrying arm assembly, any suitable mechanism can be employed and in Figures 1 and 2, I show such an arrangement. The stamping assembly is carried upon a suitable table top or bench 44 which is, in turn, mounted upon a suitable frame 45. An electric motor 46 is suitably positioned within the lower portion of the frame and carries a driving pulley 47 which is connected by a belt 48 with a larger pulley 49 carried upon a horizontal shaft 50 extending across the frame and suitably journalled therein. A belt pulley 51 smaller in diameter than the pulley 49 is secured to the shaft adjacent to the pulley 49 and carries a belt 52 passing over a pulley 53 which is carried upon a stub shaft 54 extending from a forwardly and downwardly inclined lever 55 which has its rearward end pivoted upon a horizontal shaft 56 which is also suitably journalled within the frame 45. A clutch pedal 57 is mounted on the floor and is connected to the lower end of the forward end of the lever 55. The lever 55, which is pivoted upon the shaft 56, has its forward end suspended on a spiral spring 58 which has its upper end hooked over the shaft 50.

The stub shaft 54 also carries a belt pulley 59 which is smaller in diameter than the pulley 53 and is connected by a belt 60 with a pulley 61 carried upon the shaft 56. The shaft 56 carries an ovoid-shaped cam 62. A lever 63 is pivoted at its forward end upon the shaft 50 and extends rearwardly to be connected with the lower end of the rod 7, through the medium of a boss 64 carried upon the end of the lever 63 and through which the rod 7 extends. A screw 65 is threaded into the end of the boss 64 to bear against and lock the rod 7 in place. Intermediately of the length of the lever 63 immediately above the cam 62 a boss 66 on the lever carries a freely mounted roller 67 which rides upon the cam 62. The lever 63 is urged downwardly so that the roller 67 rides upon the cam 62 through the medium of a spiral spring 68 which is hooked at its upper end to the lever 63 and at its lower end suitably attached to a cross bar 69 in the frame.

The operation of the foregoing mechanism is relatively simple. When the motor 46 is running it will, through the medium of the pulley 47, belt 48, pulley 49, pulley 51, belt 52 and pulley 53 rotate the stub shaft 54 and the pulley 59. As the lever 55 carrying the stub shaft 54 is in an upwardly swung position under the pull of the spiral spring 58 the belt 60 passing over the pulley 59 and pulley 61 on the shaft 56 will be loose so that the rotation of the pulley 59 will not be transmitted through the belt to the pulley 61 and the shaft 56 will remain stationary. When the operator depresses the clutch pedal 57 it will through the medium of the connecting rod 70 swing the lever 55 downwardly against the tension of the spring 58 and thus cause the belt 60 to tighten and the pulley 61 and shaft 56 to rotate. As the shaft 56 carries the ovoid cam 62 under the movement of which the lever 63 is actuated, it will be seen upon reference to Figure 1 that as soon as the shaft 56 and cam 62 rotate that the lever 63 will swing downwardly under the urge of the spring 68, thus

pulling the rod 7 downwardly and swinging the heating element and paper tape carrying arm assembly upwardly. The machine will operate as long as the operator keeps the clutch pedal depressed, but as soon as pressure is removed from the clutch pedal the lever 55 will swing upwardly under the pull of the spring 58 and the belt 60 will again become slack and the machine come to a standstill.

Upon reference to Figures 3, 6 and 7, it will be seen that I provide a rectangular orifice 71 in the top 44 forwardly of the forward end of the swinging arm assembly. A tilting tray 72 is positioned to be underneath the heating element, as shown in Figure 1, and to support an article 73 to be stamped. The under portion of the tray carries a pair of hinges 74 intermediately of its width and such hinges are secured to the rearward edge of the orifice 71. The tray 72 is slightly shorter in length than the orifice so that its forward end can swing downwardly into the orifice as shown in Figure 7. The portion of the tray resting upon the top 44 is furnished with a felt pad 75 so as to provide a cushioned surface for the stamping operation of the article.

The under face of the forward portion of the tray 72 carries a downwardly projecting lug 76 which is connected by a link 77 to the upper end of a bell crank lever 78, also shown in Figures 1 and 2. The bell crank lever 78 is freely fulcrumed upon the shaft 56 and the end of its lower arm carries a roller 79 which rides upon a semi-circular cam 80 attached to the side of the ovoid-shaped cam 62. The top of the bell crank lever 78 is urged in a counter-clockwise direction by a spiral spring 81. As the shaft 56 rotates when the machine is in operation, the semi-circular cam 80 will also rotate with the cam 62 and as the bell crank lever roller 79 rides thereon the lever 78 will swing once during each rotation of the shaft 56 and thus tilt the tray 72 as shown in Figure 7. The cam mechanism is so synchronized that the tray 72 will tilt as the lever 63 swings downwardly to swing the stamping arm assembly upwardly. When the tray tilts, the stamped article lying thereon will be dropped downwardly to lie over the front edge of the orifice 71, as illustrated in Figure 7. When the machine is to be put in operation, a number of articles of apparel are stacked upon the table top 44 in front of the orifice 71 and the free end of the lowermost article is placed upon the tray 72. When the stamping operation is completed and the tray tilts, the free end of the article is dropped over the edge into the orifice and the operator places the free end of the next article in the stack on the tray 72, which is then returned to the horizontal position, for the next stamping operation.

In order to draw off and control the free end of the used tape 18 as it passes from between the rollers 19 and 20, I suitably mount a pair of driven rollers 82 underneath the bench top 44 and between which the free end of the tape is passed. The rollers 82 can be driven from any suitable point, as for example, by a belt 83 carried upon a pulley 84 mounted upon the shaft 56 and extending to a pulley 85 on one of the rollers 82.

From the foregoing description, it will be apparent that I have devised a very simple and practical machine for stamping articles of wearing apparel, and, although I have shown and described a particular embodiment of my invention, it is to be understood that I can make such changes and alterations as I may from time to time deem necessary without departing from the spirit of my invention as set forth in the appended claims.

What I claim as my invention is:

1. An apparatus for placing transfer emblems on hosiery and other objects from a roll of paper tape having thereon spaced apart ink embossed transfer emblems, comprising a member upon which the hosiery rests, means for supporting the roll of tape and from which the tape extends, means for feeding the tape in one direction only into a position proximate to the hose, heated means for pressing a transfer emblem on the tape against the hose, and mechanically retractable means positioned adjacent to the face of the tape carrying the emblems and towards which the tape feeds and adapted to impact the edge of an embossed emblem on the tape to mechanically arrest the feeding movement of the tape.

2. An apparatus as claimed in claim 1 wherein the tape has embossed transfer emblems and embossed characters thereon, the embossed transfer emblems being applied to the hose and the embossed characters being impacted by the retractable tape movement arresting means.

3. An apparatus as claimed in claim 1 wherein the retractable means comprises a swingably mounted blade adapted to swing towards and away from the tape, and a plate member oppositely positioned to the blade at the other side of the tape and upon which the tape slides.

4. An apparatus as claimed in claim 1 wherein the retractable means comprises a swingably mounted blade adapted to swing towards and away from the tape, a plate member oppositely positioned to the blade at the other side of the tape and upon which the tape slides, and wherein the tape has embossed transfer emblems and embossed characters thereon, the embossed transfer emblems being applied to the hose and the embossed characters being impacted by the edge of the blade.

5. In an apparatus for impressing transfer emblems on hosiery and other objects from a paper tape having ink embossed transfer emblems on its face and moving in one direction only across the face of the hose to be impressed, heated means for pressing the transfer emblems on the tape against the hose, and a mechanically retractable member positioned adjacently to the face of the tape carrying the transfer emblems and towards which the tape feeds and adapted to impact the edges of the embossed emblems on the tape to mechanically arrest the movement of the tape and being so located that the tape moves from the retractable member to the hose.

6. In an apparatus for placing transfer emblems on hosiery and other objects from a roll of paper tape having thereon spaced apart ink embossed transfer emblems, a member upon which the hosiery rests, means for supporting the roll of tape and from which the tape extends, means for feeding the tape in one direction only through a position proximate to the hose, a rotating roller pulling the tape and over which the tape passes upon moving from the position proximate to the hose, heated means positioned proximate to the hose for pressing a transfer emblem on the tape against the hose, a mechanically retractable barrier blade towards which the tape feeds and fulcrumed laterally above and swingable towards the tape in such a manner as to present an obstruction in the path of travel of the embossed emblems on the tape so that the movement of the tape is arrested by the barrier blade impact-

ing the leading edge of an embossed emblem whereby such arresting force exceeds the traction of the roller pulling the tape, and means synchronizing the pressing of a transfer emblem on the tape against the hose with the movement of the retractable barrier blades into contact with the edge of an emblem on the tape.

7. In a device of the character described, the combination with a length of paper tape having spaced apart ink embossed transfer emblems thereon, of a member for supporting hosiery to be stamped, means for passing the tape in one direction only across the face of the hosiery on the member, means for pressing a transfer emblem on the tape against the hose, and mechanically retractable means towards which the tape feeds and operating in synchronization with the transfer pressing means and adapted to impact the leading edge of an embossed emblem on the tape to mechanically arrest the movement of the tape across the hose.

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