July 27, 1954 H. RICHTER ET AL 2,684,547

TRANSFER APPLYING MACHINE

Filed May 28, 1949 4 Sheets-Sheet 1

Fig. 1.

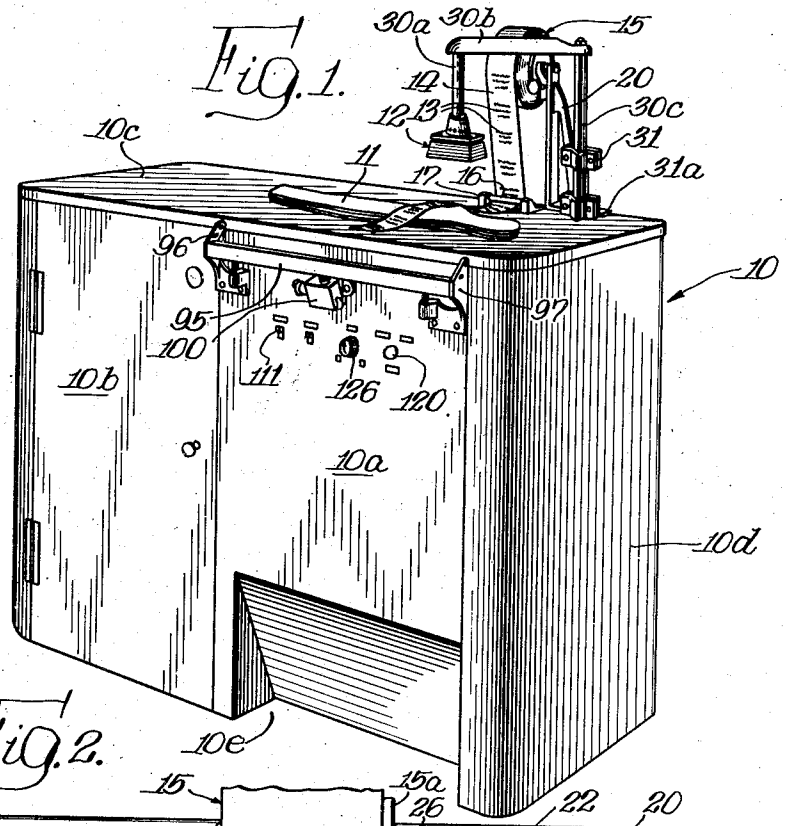
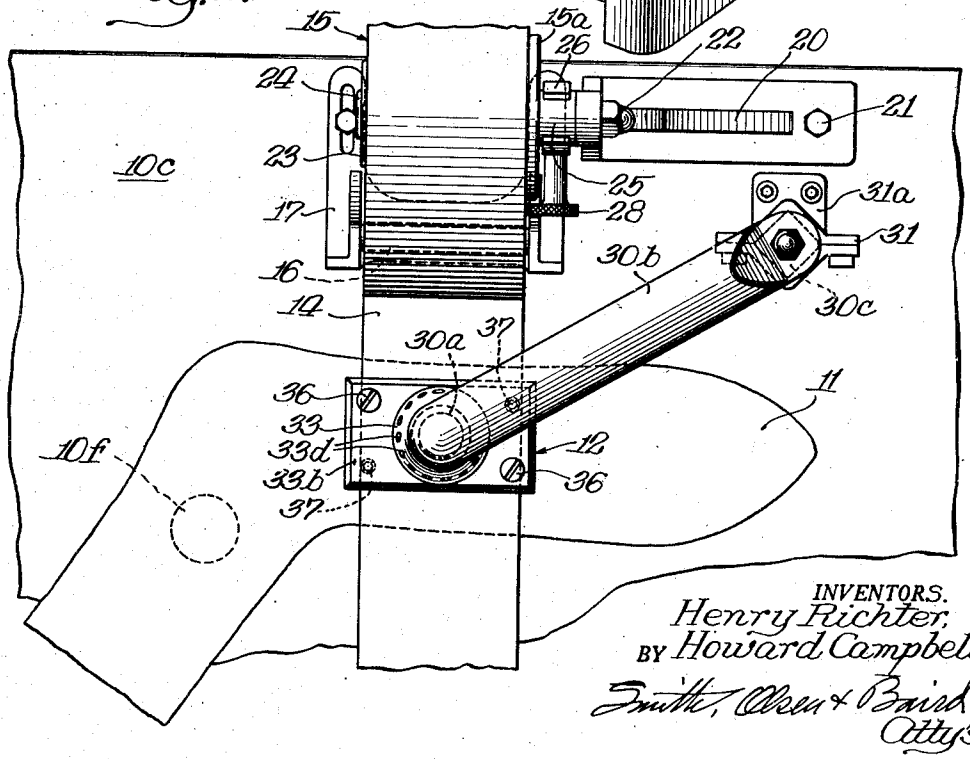


Fig. 2.



INVENTORS.
Henry Richter,
BY Howard Campbell,
Smith, Olsen & Baird,
Atty's.

July 27, 1954 H. RICHTER ET AL 2,684,547

TRANSFER APPLYING MACHINE

Filed May 28, 1949 4 Sheets-Sheet 2

Fig. 3.

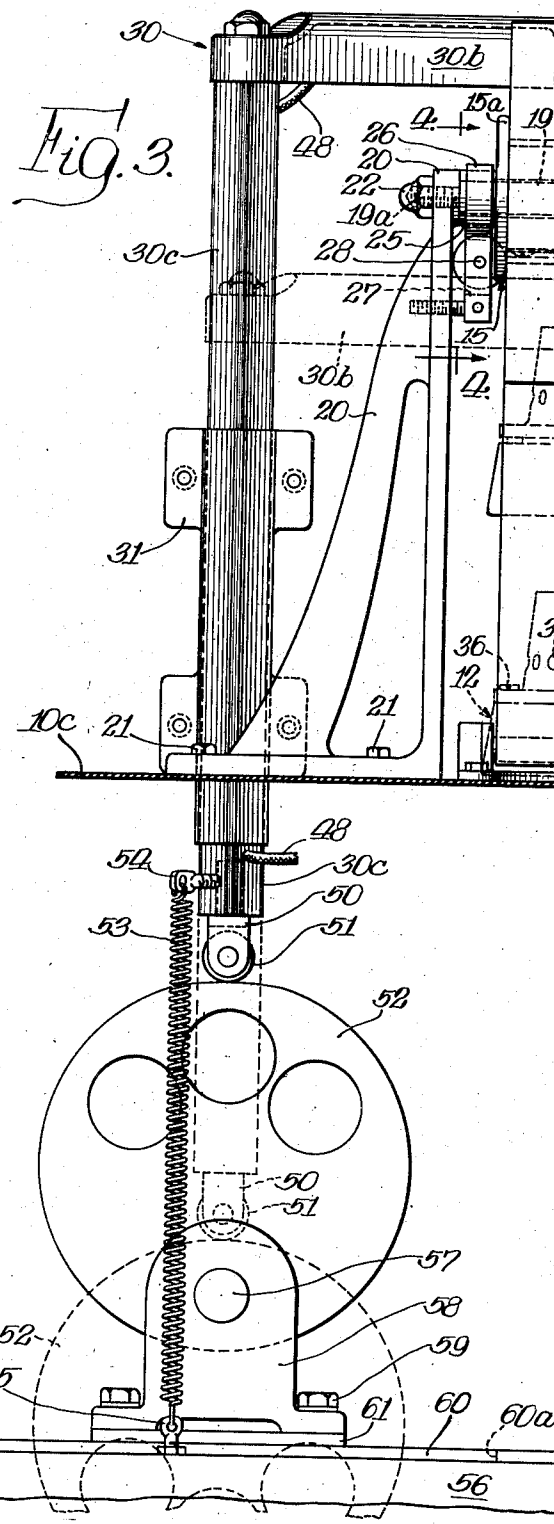
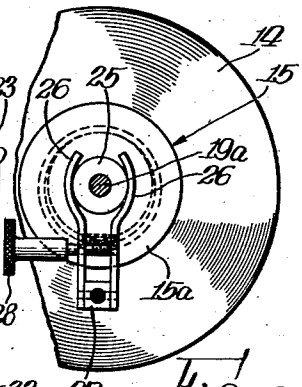


Fig. 4.



INVENTORS.
Henry Richter
BY Howard Campbell,
Smith, Allen & Baird,
Attys.

July 27, 1954 H. RICHTER ET AL 2,684,547

TRANSFER APPLYING MACHINE

Filed May 28, 1949 4 Sheets-Sheet 3

Fig. 5.

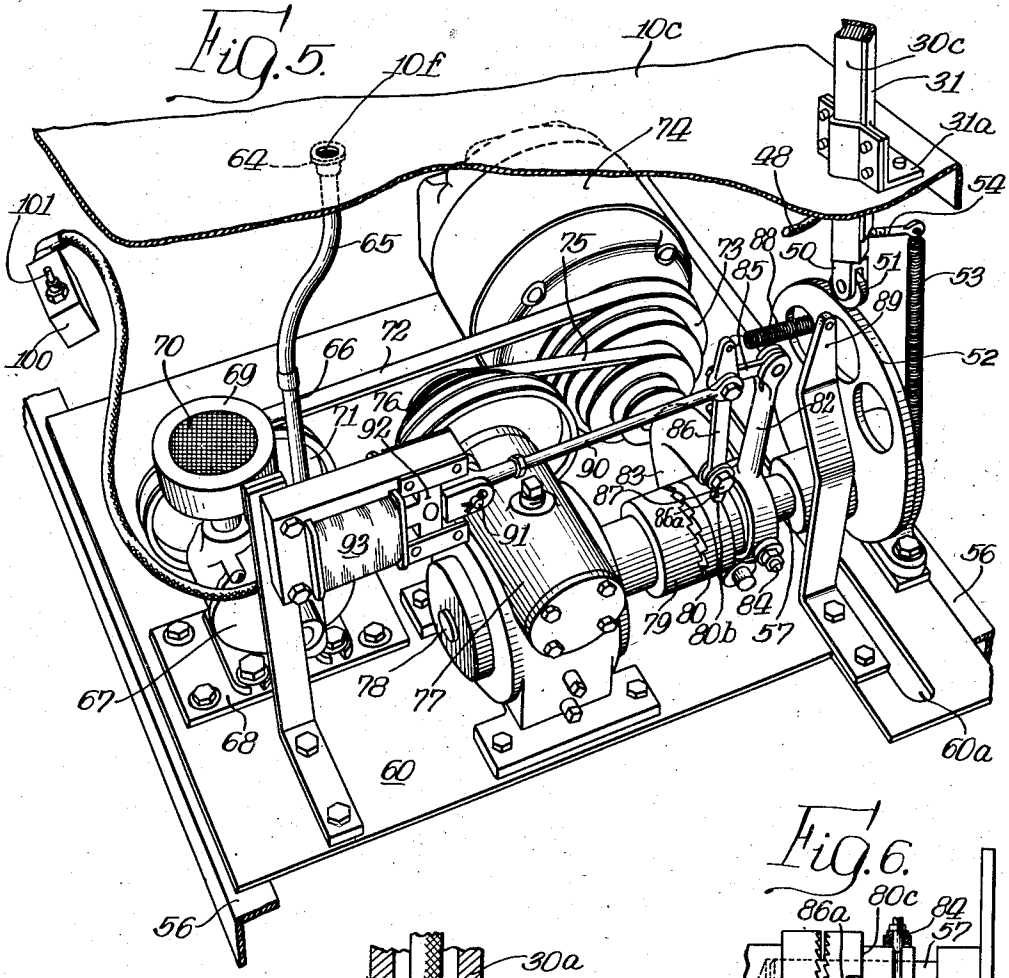
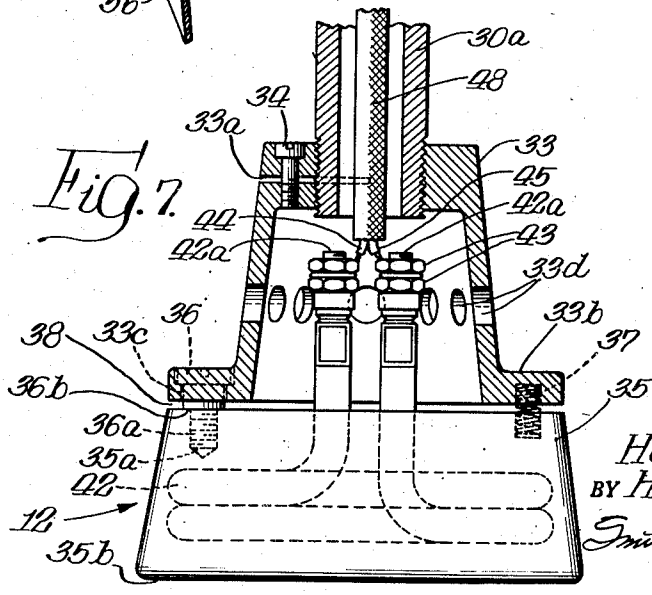


Fig. 6.

Fig. 7.



INVENTORS.
Henry Richter,
BY Howard Campbell,
Smith, Olsen & Baird,
Attys.

July 27, 1954 H. RICHTER ET AL 2,684,547

TRANSFER APPLYING MACHINE

Filed May 28, 1949 4 Sheets-Sheet 4

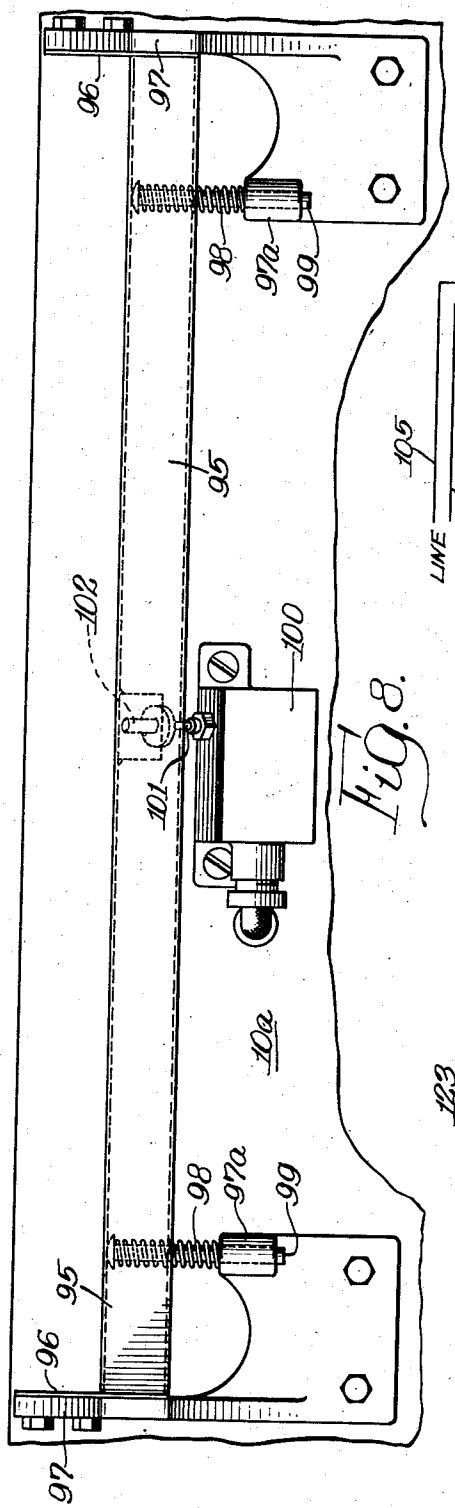


Fig. 8.

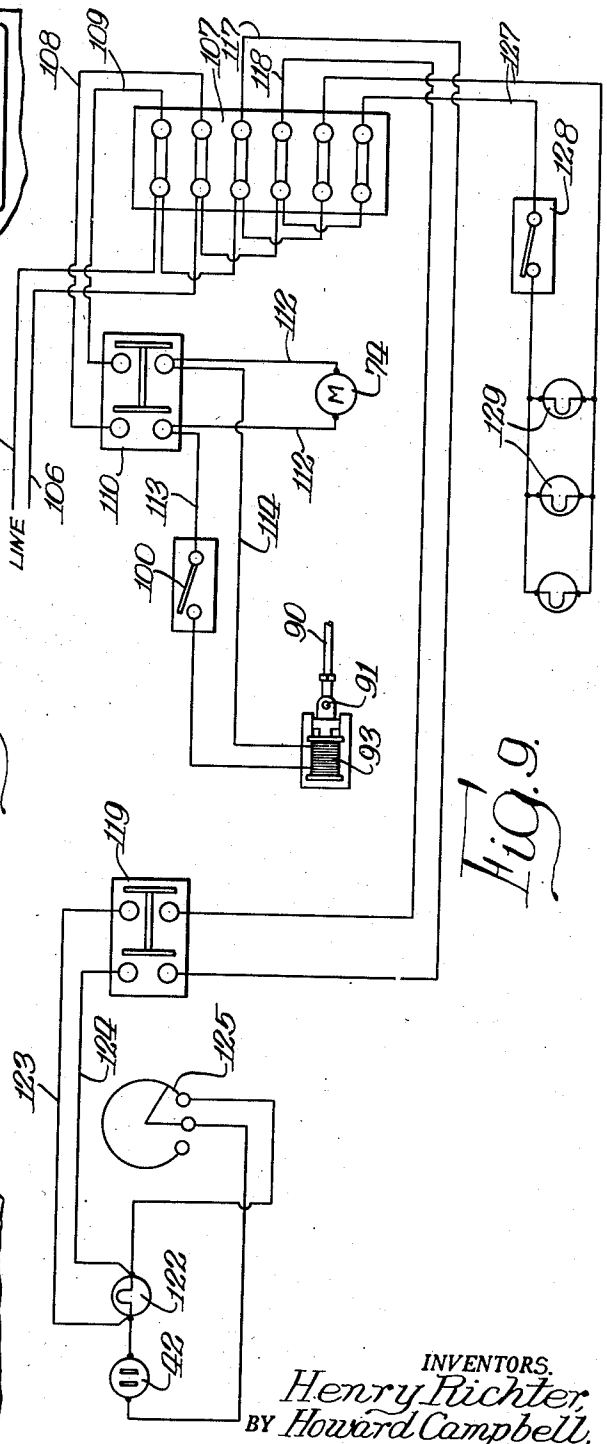


Fig. 9.

INVENTORS.
Henry Richter,
BY Howard Campbell,
Smith, Olsen & Baird,
Atty's.

Patented July 27, 1954

2,684,547

UNITED STATES PATENT OFFICE

2,684,547

TRANSFER APPLYING MACHINE

Henry Richter and Howard Campbell, Kankakee, Ill., assignors to Paramount Textile Machinery Co., Kankakee, Ill., a corporation of Illinois

Application May 28, 1949, Serial No. 96,064

4 Claims. (Cl. 41—1)

1

This invention relates to improvements in transfer machines and methods by which trademarks, legends, brand names or other indicia are transferred from a movable carrier to articles of clothing, such as hosiery, or other articles to which they are to be applied. The present invention may be embodied, for example, in the type of machine which is described and claimed in United States Letters Patent No. 2,323,843, granted July 6, 1943, on an application of Henry Richter, John H. Wahlbeck, and Leonard S. Kleinfeld.

It is desirable to mark hosiery and other articles with indicia indicating trade names, sizes, quality or other information transferred from a movable carrier such as a roll of tissue paper on which the indicia are imprinted in spaced relation by means of wax or other material having a relatively low melting point. When a portion of the carrier bearing the wax imprint is pressed against the surface of the article to be marked and heat applied, the wax melts and the indicia carried thereby is transferred to the article. The article is then moved and the carrier shifted to bring another wax imprint into engagement with another article and the operation is repeated. A difficulty which has been encountered in the operation of such transfer machines heretofore has been that the pile of articles to be marked or labelled tends to shift its position between successive operations so that the indicia do not appear in identical locations on different articles of the same group or class. Another difficulty has arisen from the fact that the pile of hosiery usually does not have a flat or horizontal top surface so that the transfer of the indicia has sometimes been incomplete.

The principal object of the present invention is to provide apparatus and methods for transferring indicia to a series of articles according to which the successive articles are held in a predetermined location so that the imprints are located in identical positions on successive articles. A further object is to provide a transfer machine having a support on which a pile of hosiery or other articles is secured in position by the application of suction so that, as the transfer operations take place and the articles are successively removed from the top of the pile, the indicia transferred from a carrier are located in substantially identical positions on the several articles. Another object is to provide a transfer machine comprising a self-aligning imprinting iron by which the indicia is heated and transferred effectively even though the hosiery pile

2

may have an uneven top surface. Still another object is to provide improved means for controlling the intermittent operation of the transfer machine while the indicia are being applied to the articles to be marked. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment is illustrated. In the drawings,

Figure 1 shows a perspective view of the casing and a portion of the operating mechanism of a machine embodying the present invention, illustrating a pile of hosiery in position to have indicia transferred thereto from a movable carrier strip;

Fig. 2 shows an enlarged top plan view of a portion of the machine illustrated in Fig. 2, showing the means by which the pile of hosiery is held and the means by which the indicia are transferred thereto from the movable carrier;

Fig. 3 shows a vertical section through the cabinet of the apparatus illustrated in Fig. 1, the section being taken longitudinally of the cabinet looking toward the front side thereof;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3 showing a partial side elevation of the coil of tape which constitutes the carrier for the indicia to be transferred, and illustrating the brake for controlling the rotation of the coil;

Fig. 5 is a perspective view of the actuating mechanism mounted within the cabinet by which the imprinting iron is moved and by which suction is applied to the lowermost one of the articles of hosiery or the like to which the indicia are to be applied;

Fig. 6 shows a top plan view of the clutch illustrated in Fig. 5 with certain cooperating parts shown in horizontal section;

Fig. 7 shows an enlarged vertical section through the casing of the imprinting iron taken longitudinally of the cabinet;

Fig. 8 shows an enlarged front elevation of the actuating bar by which the successive operations of the imprinting iron are controlled; and

Fig. 9 is a circuit diagram of the electric connections of the imprinting iron, the motor by which the apparatus is driven, and other electrically operated parts which are included in the construction.

As shown in Fig. 1, the invention is embodied in an upright cabinet 10 having a stationary front panel 10*a*, a hinged front door 10*b*, a horizontal top or worktop 10*c*, and end walls 10*d*. The sta-

tionary front panel 10a has its lower part recessed toward the rear as shown at 10e to provide space for the feet of the operator and the space behind the hinged door 10b is adapted to contain a series of shelves upon which the hosiery or other articles to be marked may be placed within convenient reach of the operator.

The top 10c of the cabinet is preferably formed of plated metal or stainless steel having a smooth surface and it is adapted to form a support for a pile or stack of hosiery or other articles 11 to which the indicia are adapted to be applied through the operation of an imprinting iron 12 which is movable vertically with respect to the pile of hosiery 11. The indicia 13 which are to be applied to successive pairs of hosiery are mounted in uniformly spaced relation to each other upon a movable carrier 14 which may be in the form of a comparatively narrow tape of tissue paper or the like wound in the form of a coil on a reel 15. The free end of the carrier tape 14 extends downwardly from the reel and passes beneath a roller 16 carried by a bracket 17 which is secured to the top 10c of the cabinet at the rear of the pile of hosiery. The operator who occupies a position in front of the stationary panel 10a moves the tape by grasping the free end thereof and pulling it in a forward direction until one of the indicia 13 is located in proper position with respect to the uppermost stocking of the pile, whereupon the heated imprinting iron 12 is caused to move downwardly to melt the wax by which the indicia is carried and thereby cause the indicia to be transferred to the surface of the uppermost stocking. After one transfer has been made, the imprinting iron 12 is elevated and the operator then lifts the tape, folds over the uppermost pair of stockings and then moves the tape in a forward direction to locate another indicia on the tape in the same position over the uppermost stocking of the next pair, whereupon the imprinting iron 12 is again lowered to repeat the transfer operation.

The reel 15 is in the form of a spool mounted upon a shaft 19 which is journaled in a bracket 20 extending upwardly from the cabinet top 10c to which it is secured by studs 21, as shown in Fig. 3. The shaft 19 has a threaded extremity 19a which engages an aperture in the top end of the bracket 20 and this threaded part is engaged by a nut 22 so that the shaft is detachably secured in position. The spool 15 has a flange 15a at one end against which the inner portion of one end of the coil of tape 14 is seated and the reel is secured on the shaft 19 by means of a washer 23 and a screw 24. In order to control the freedom with which the tape 14 may be withdrawn from the coil, the shaft 19 has mounted on the inner end thereof a drum 25 engaged by two friction brake springs 26 carried by the stationary block 27 attached to the standard 29. An adjusting screw 28 threadedly engages the springs 26 and may be manipulated to adjust the pressure of the brake springs 26 on the drum 25.

The imprinting iron 12 is mounted upon the lower end of a hollow tube 30a which depends from the outer end of an arm 30b mounted on a post 30c which reciprocates vertically in a guide 31 having a flange 31a which is secured to the casing top 10c. The post 30c, being of square cross section, is held against rotation in the guide 31 of similar cross section, although free to move vertically.

As shown particularly in Fig. 3, the tube 30a of the U-shaped iron support fits into a socket in the arm 30b where it is detachably secured in place by setscrews 30d. The lower end of this tube is threaded, as shown in Fig. 7, for engagement with the threaded aperture formed in the upper end of a housing 33 which constitutes the supporting frame of the imprinting iron 12. The upper wall of this housing is provided with a transverse slot 33a and a clamping screw 34 extends through this slot and engages a threaded aperture in the wall of the housing so that when the screw is tightened the parts on opposite sides of the slot 33a are drawn together, thus clamping the housing 33 against rotation with respect to the tube 30a. The housing 33 has downwardly and outwardly flaring lateral walls which terminate in outwardly directed flanges 33b to which there is attached a body of metal 35 constituting the heated plate or iron proper which is heated for the purpose of causing the indicia carried by the tape 14 to be transferred to the stockings in the pile 11 on the casing top. In order that the heated plate or imprinting member 35 may have some relative movement with respect to the casing 33 so as to conform to irregularities in the slope or surface contour of the uppermost stocking in the pile, the member 35 is attached to the flanges 33b by means which permit some relative movement of these parts. At diagonally opposite corners of the rectangular iron 35, the parts are secured together by screws 36 which somewhat loosely engage apertures 33c in the flanges 33b and which have reduced extremities 36a threadedly engaging recesses 35a formed in the member 35. At the ends of the threaded portions 36a, the shoulders 36b of the screws 36 seat upon the upper surface of the member 35, thus providing a clearance 38 between the member 35 and the bottom surface of the member 33 which allows some relative movement of the parts 33 and 35. At the other diagonally opposite corners of the member 35, the member 35 and the flanges 33b are provided with oppositely disposed recesses in which are seated the ends of coil springs 37. These coil springs normally maintain the members 33 and 35 in the spaced relation shown in Fig. 7, wherein the clearance 38 is of the same magnitude around all parts of the flanges 33b. However, if there is any unevenness or variation in slope of the upper surface of the uppermost stocking in the pile, the member 35 is permitted to tilt with respect to the member 33 due to the presence of the springs 37 and the loose connections provided by the screws 36 so that the lower surface 35b of the iron proper is permitted to conform to the surface of the uppermost stocking and thereby bring about a complete transfer of the entire indicia carried by the tape 14.

The iron proper 35 is heated by an electric heating element 42 which is embedded therein and which has its terminals 42a extending upwardly within the chamber of the housing 33 where the threaded extremities are engaged by nuts 43 between which the lower ends of the conductors 44 and 45 which lead from a source of electric current are clamped. These conductors are embodied in an insulated cable 48 which leads downwardly through the tube 30a from the hollow arm 30b and the hollow post 30c, the supply end of this cable being connected in the circuit below the table top 10c. With the arrangement which has just been described, it is possible to effect a ready detachment of the housing 33 and the ironing element 35 carried thereby so that one imprinting iron may be interchanged with another of different size in order to accommo-

date the apparatus to the size and character of the indicia which are to be transferred.

The lower end of the post 30c of the iron supporting standard 30 has a relatively fixed bracket 50 on which there is mounted a roller 51 adapted to travel upon the peripheral surface of a cam 52 by which the imprinting iron 12 is caused to reciprocate vertically to and from its operative position. The roller 51 is maintained in contact with the surface of the cam 52 by means of a coil spring 53 which has its upper end attached to a pin 54 fixed in the lower end of the post 30c and which has its lower end attached to an eye bolt 55 secured in one of the angle bars 56 which form a part of the interior construction of the cabinet 10, as shown in Figs. 3 and 5. The cam 52 is eccentrically mounted upon a cam shaft 57 journaled in a bearing bracket 58 which is attached by means of studs 59 to a table 60 carried by the frame members 56 behind the front panel 10a. A spacing plate 61 is interposed between the table 60 and the flanges of the bracket 58. The table 60 is provided with a slot 60a into which the cam 52 may descend when it is rotated from the position shown by full lines in Fig. 3 to the position shown by dotted lines, corresponding to the movement of the imprinting iron 12 from the uppermost position shown in Fig. 3 to the operative position wherein it engages the carrier tape on the uppermost stocking of the pile. The cam 52 is adapted to be intermittently operated to cause the imprinting iron 12 to be lowered to its operative position each time that a new indicia on the tape 14 is brought to position over a new article on the pile 11.

For the purpose of holding the pile of hosiery or other articles 11 in the proper position on the casing top 10c, this top is provided with an aperture 10f through which suction is applied to the lowermost article in the pile, it having been found that if the lowermost article is held stationary, those above it will remain in proper position due to their frictional contact with each other. Suction is applied to the opening 10f through a hollow fitting 64 which has connected thereto a flexible tube 65 leading to the vertical pipe 66. This pipe has its lower end connected to the intake of a suction pump 67 which has its base plate secured to a plate 68 fixed on the table 60. The suction pump 67 has an outlet 69 which is protected by a screen 70 to keep dust and the like from entering the interior of the pump. The pump is driven by a pulley 71 fixed on its shaft and actuated by a belt 72 which extends therefrom to a multiple groove pulley 73 secured on the shaft of an electric motor 74. This motor is fixed on the table 60 and is in operation at all times when the transfer mechanism is being employed so that the suction is constantly applied through the opening 10f in the top of the cabinet.

The motor 74 also serves to drive the cam 52 through connections which are shown particularly in Fig. 5. These connections comprise a belt 75 extending from the multiple groove pulley 73 on the motor shaft to another multiple groove pulley 76 on the shaft of a gear reducer 77 which is mounted on the table 60. The shaft 78 of the gear reducer has fixed thereon a clutch member 79 having clutch teeth which are adapted to engage the teeth of another clutch member 80 which is splined upon the shaft 57 to which the cam 52 is secured. The shafts 78 and 52 have a telescoping engagement with each other, shown in Fig. 6, and when the clutch member 80 is moved into engagement with the clutch member 79 the shaft 57 is actuated to rotate the cam 52 and thereby move the imprinting iron to its operative position. The cam is normally in the position shown in Fig. 5 wherein the imprinting iron is in its upper or inoperative position.

The clutch member 80 is actuated by a clutch lever 82 which is pivoted on a fixed bracket 83 and which carries a pair of pins 84 engaging the annular groove 80a in the clutch member so that when the lever 82 is oscillated about its pivot, the clutch member 80 is moved longitudinally of the shaft 52 and into or out of engagement with the clutch member 79. The upper end of the clutch lever 82 is connected by a link 85 with another lever 86 which is pivoted at 87 on the bracket 83 and which is provided at its lower end with a tooth 86a adapted to engage a recess 80b in the clutch member 80 when the clutch members are disengaged. The lever 86 and the lever 82 are normally moved toward the right, as viewed in Fig. 5, to disengage the clutch members, by means of a coil spring 88 which extends from the upper end of the lever 86 to a fixed bracket 89 secured to the table 60. When the lever 86 is rocked about its pivot, its motion is transmitted to the clutch lever 82, thereby actuating the clutch member 80. The movement of the lever 86 against the tension of the spring 88 is effected by a rod 90 which is connected by a pivot 91 with the magnetizable core 92 of a solenoid 93 arranged to be connected in the operating circuit as hereinafter described. When the solenoid is energized, the magnetizable core 92 is moved toward the left as viewed in Fig. 5, with the result that the clutch members 79 and 80 are engaged, thereby causing the cam 52 to rotate with a resulting downward movement of the imprinting iron 12 under the influence of the coil spring 53.

When the clutch members are thus engaged the tooth 86a of the lever 86 is simultaneously disengaged from the recess 80b and then rides on the end surface 80c of the clutch member 80 and holds the clutch members engaged until the recess 80b has completed one revolution. The spring 88 then causes the tooth 86a again to engage the recess 80b and causes the clutch members 79 and 80 to disengage. This arrangement causes the cam 52 to stop in its normal position at the end of each revolution with the imprinting iron 12 in its elevated position.

In order that the solenoid 93 may be conveniently actuated to control the rotation of the cam 52 and the resulting movement of the imprinting iron, the cabinet 10 is provided adjacent the upper edge of the panel 10a with a switch actuating bar 95 shown particularly in Figs. 1 and 7. This bar has its ends secured to plates 96 which project inwardly therefrom and which have their end portions pivoted to brackets 97 attached to the panel 10a. The bar 95 is normally maintained in its uppermost position, shown in Fig. 1, by means of coil springs 98 which are interposed between bosses 97a formed on the brackets 97 and the heads of pins 99 slidably engaging apertures in these bosses. The heads of the pins engage the upper walls of the hollow bar 95, as shown in Fig. 7, and they are normally moved in an upward direction by the spring 98 to hold the bar 95 in its normal position.

When the bar 95 is moved downwardly by the pressure of the body of the operator against it, it actuates an electric switch 100 secured to the panel 10a and having an actuating plunger 101

arranged to be operated by a pin 102 attached to the bar 95. When the switch 100 is thus closed, the solenoid 93 is energized to cause the clutch members 79 and 80 to engage, thereby causing the cam 52 to rotate through one revolution and effect a downward and reverse movement of the imprinting iron 12. With this arrangement, the movement of the imprinting iron may be controlled by the body of the operator, leaving the hands free for the manipulation of the articles in the pile 11 and for the movement of the tape 14 by which the indicia are carried. A momentary pressure upon the bar 95 is sufficient to close the switch 100 and effect an actuation of the cam 52 through one revolution. If the operator continues to press on the bar 95 the cam 52 will continue to rotate without interruption to cause a series of working movements of the imprinting iron.

The electric circuit about which the imprinting iron 12, the electric motor 74, the solenoid 93 and other devices are actuated and controlled, is shown diagrammatically in Fig. 9. This circuit comprises line conductors 105 and 106 leading from a source of current supply to a terminal block 107 from which several parallel branch circuits lead to the different devices to be actuated. One of these branch circuits includes a pair of conductors 108 and 109 leading to a double pole switch 110 which is controlled by a push button 111 mounted on the panel 10*a*. When this switch 110 is closed it establishes the circuit of the motor 74 through the conductors 112 and at the same time it connects the source of supply with two conductors 113 and 114 which lead to the solenoid 93. One of these conductors 113 has connected therein the switch 100 adapted to be actuated by the bar 95. Thus, the circuit of the solenoid 93 may be closed only when the switch 110 has been actuated to cause the operation of the motor 74 which drives the suction pump and also supplies the power for causing the rotation of the cam 52.

The terminal block 107 also has leading therefrom a pair of conductors 117 and 118 which lead to a double pole switch 119 adapted to be actuated by a member 120 located on the front panel 10*a*. When the switch 119 is closed it closes the circuit of the heating element 42 and also the circuit of a pilot light 122 which serves to indicate to the operator that the imprinting iron is heated. The bulb of the pilot light 122 may be located in any desired position, for example, within the housing 33 of the imprinting iron from which the light would be visible through the apertures 33*d* which are provided in the housing. The pilot light 122 and the heating element 42 are connected in parallel, being supplied with current from the switch 119 through conductors 123 and 124. The heating element 42 has connected in series therewith a rheostat 125 adapted to be operated by a controlling member 126 mounted on the panel 10*a* so that the degree of heat of the imprinting iron 12 may be conveniently regulated by the operator. The terminal block 107 also has leading therefrom a pair of conductors 127 which are connected through a switch 128 to a series of lamps 129 which may be located within the cabinet behind the door 10*b* for the purpose of illuminating the shelves on which the articles to be marked are stored.

In the operation of this apparatus with hosiery, for example, the pile of hosiery, usually one dozen pairs, are placed upon the top 10*c* of the casing with the foot portions thereof positioned beneath the imprinting iron 12 and with other portions thereof extending over the aperture 10*f*. Having closed the switch 110, the motor 74 then actuates the pump 67 to cause suction to be applied through the opening 10*f* whereby the pile of hosiery is held in position. The several pairs of hosiery should be in vertical alignment with each other and with the stockings of each pair in exact alignment. A portion of the tape 14 is then withdrawn from the reel to cause one of the indicia 13 to be positioned over the desired portion of the foot of the uppermost stocking. The operator will have closed the switches 110 and 119 and with the stockings and the tape thus positioned, the bar 95 is then actuated to close the switch 100, thus energizing the solenoid 93 and causing the clutch members 79 and 80 to engage so that the cam is rotated to move the imprinting iron 12 downwardly until it engages the indicia on the tape 14 which is positioned on the uppermost stocking. The application of the heat of the iron will melt the wax and cause the indicia to be transferred to the stocking and the imprinting iron 12 is then withdrawn by the rotation of the cam so that the operator can lift the tape, fold over the upper pair of stockings, and then move the tape to position another indicia over the uppermost stocking whereupon the bar 95 is again actuated to cause another transfer to be made. The tendency for the pile of stockings to slip on the top of the casing during this operation is overcome by the constantly applied suction which holds the lowermost stocking in place even when the pile has been reduced to the point where only one pair of stockings is left. When all of the stockings of one pile have been marked, a new pile is put into position and the operation is repeated.

Although one form of the invention has been shown and described by way of illustration, it will be understood that it may be constructed in various other embodiments which come within the scope of the appended claims.

We claim:

1. The combination in a machine for transferring indicia from a carrier to articles to be marked, of a support for a pile of said articles, an imprinting iron movable into engagement with indicia seated upon the uppermost article in said pile, said imprinting iron comprising a housing and a heated plate, a pair of oppositely disposed connecting members attached to said plate and loosely enaging said housing, and a pair of oppositely disposed springs located in positions displaced from said members and acting normally to separate said plate from said housing, said members and said springs permitting relative tilting movement of said plate with respect to said housing whereby said plate may conform to the surface contour of the uppermost article in said pile.

2. In a machine for transferring indicia from a carrier to hose to be marked, a substantially horizontal smooth stationary worktop arranged to support a stack of hose, said worktop having an opening formed therein and arranged to be covered by the supported stack of hose, means for producing a suction in said opening to anchor the lowermost hose in said stack to said worktop and thus prevent sliding movement of said stack with respect to said worktop, a movable heating device disposed over said carrier, and means for moving said heating device into engagement with said carrier in order to transfer the indicia borne thereon onto the uppermost hose in said stack.

3. The combination in a machine for transferring indicia from a carrier to articles to be marked, of a support for a stack of said articles, an imprinting iron comprising a housing and a heated element thereon relatively movable in tilting motion with respect to said housing, movable means for supporting said housing, means for actuating said means to move said heated element into engagement with said carrier seated on the uppermost article in said supported stack in order to transfer the indicia from said carrier to said uppermost article, and means including resilient members connecting said housing and said heated element for accommodating said tilting motion of said heated element with respect to said housing so that said heated element may conform to the surface of said uppermost article.

4. The combination in a machine for transferring indicia from a carrier to articles, to be marked, of a support for a stack of said articles, an imprinting iron comprising a housing of rectangular cross section and a relatively movable heated element carried thereby, a support for said housing, means for actuating said support to move said heated element into engagement with said carrier seated on the uppermost article in said stack for transferring the indicia from said carrier to said uppermost article, means loosely connecting diagonally opposite corners of said housing with said heated element, and springs interposed between the other diagonally opposite corners of said housing and said heated element, whereby said heated element is free to adjust itself to the surface contour of the uppermost article in said stack when actuated by the movement of said support.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,086,400	Richardson	Feb. 10, 1914
1,504,545	Chadwick	Aug. 12, 1924
1,759,712	Richardson	May 20, 1930
2,015,216	Creser	Sept. 24, 1935
2,078,448	Jost	Apr. 27, 1937
2,177,615	Autem	Oct. 24, 1939
2,362,168	Stokes	Nov. 7, 1944
2,441,164	Miller	May 11, 1948
2,465,028	McNaughton	Mar. 22, 1949
2,484,901	Newton	Oct. 18, 1949
2,493,522	Brownlee	Jan. 3, 1950
2,538,972	Magnani	Jan. 23, 1951