Oct. 20, 1936. J. Q. SHERMAN 2,057,696

WRITING MACHINE FOR THERMAL RESPONSIVE TRANSFER MATERIAL

Filed Jan. 27, 1934 3 Sheets-Sheet 1

Fig. 1

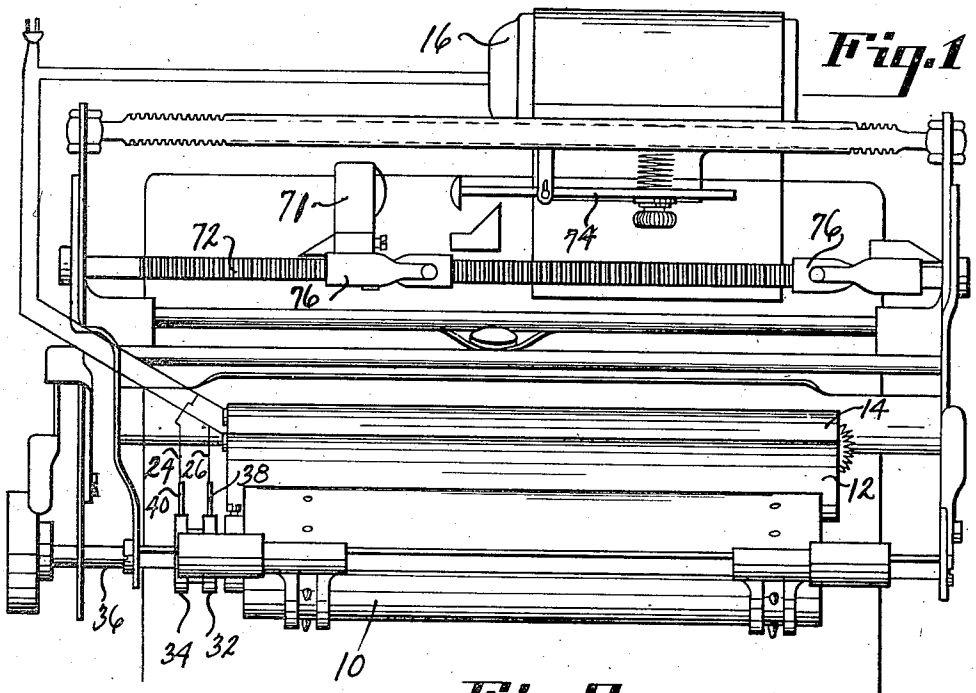
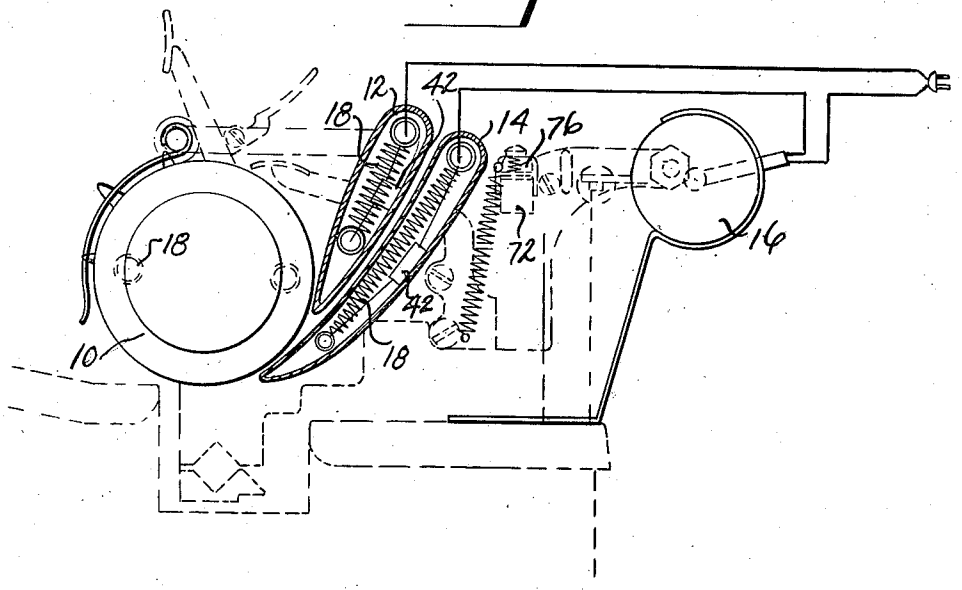


Fig. 2



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WRITING MACHINE FOR THERMAL RESPONSIVE TRANSFER MATERIAL

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Fig. 3

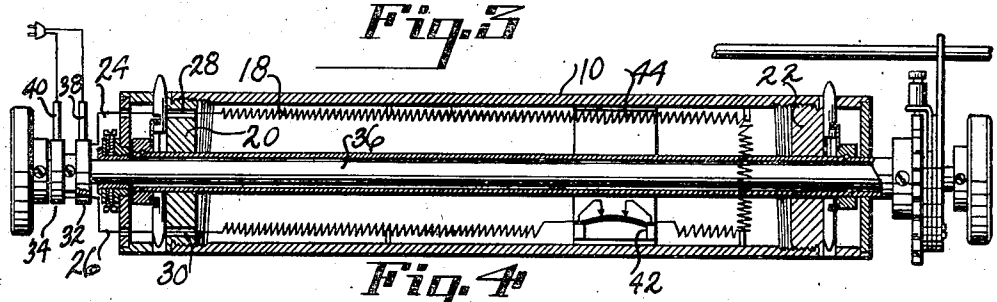


Fig. 4

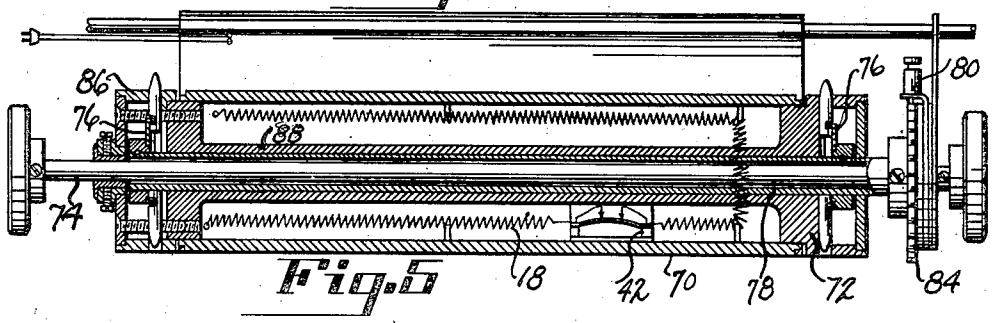


Fig. 5

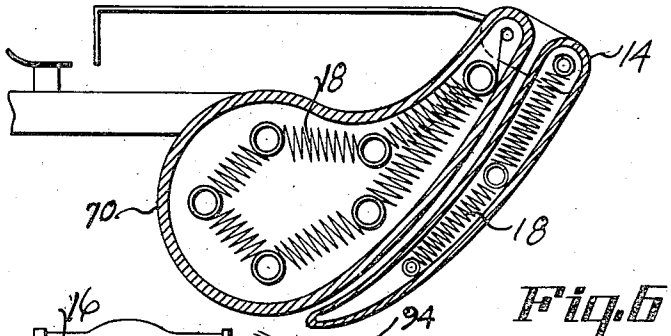
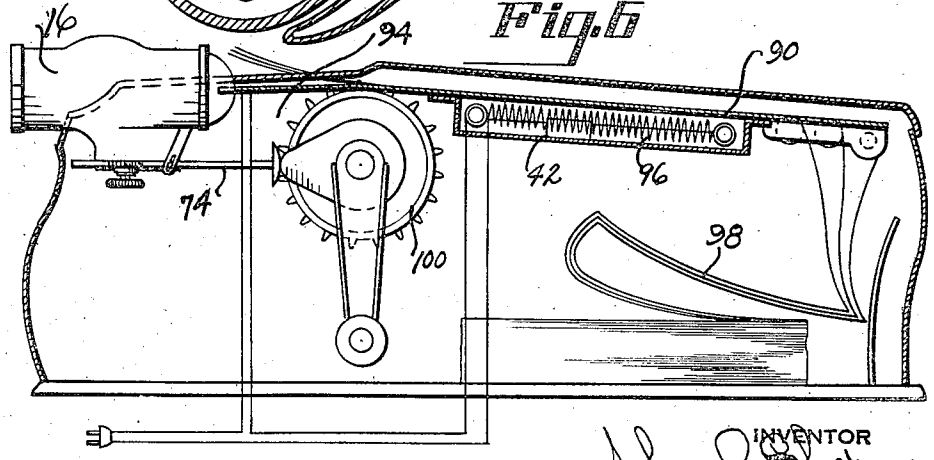


Fig. 6



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WRITING MACHINE FOR THERMAL RESPONSIVE TRANSFER MATERIAL

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Fig. 7

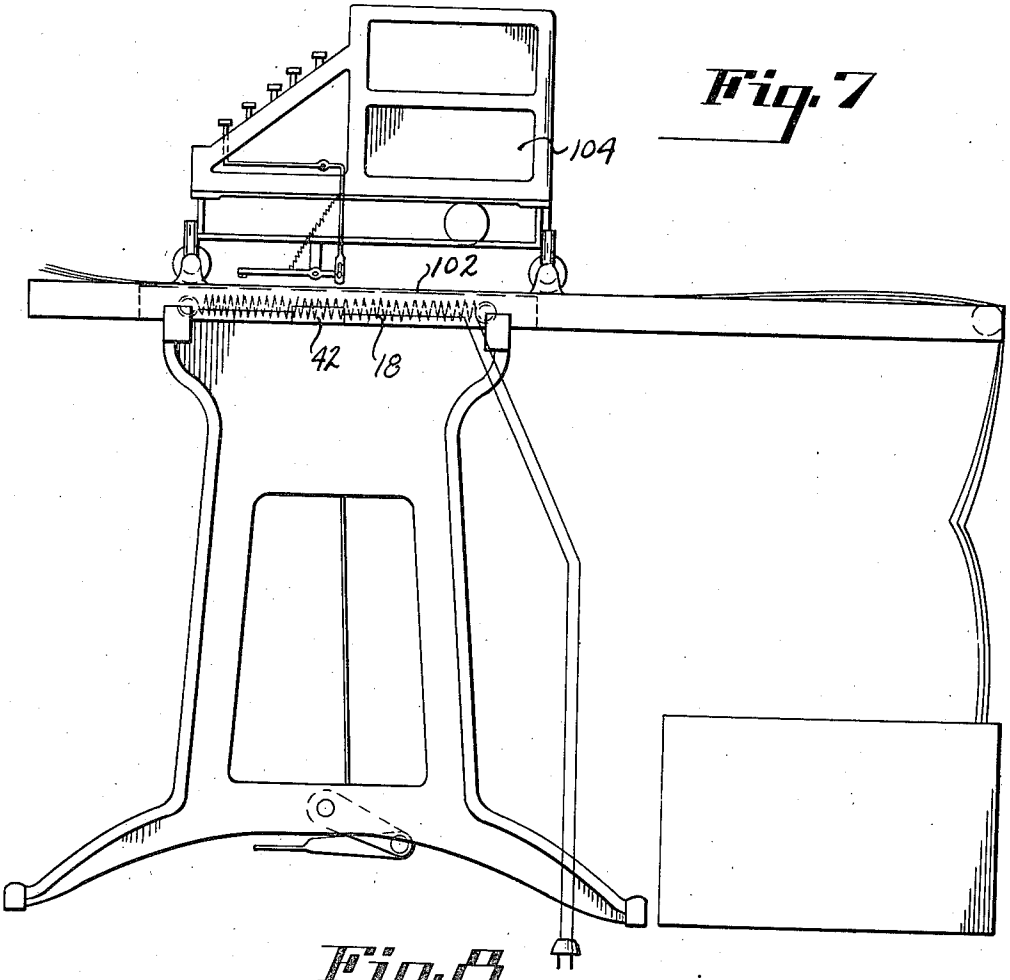


Fig. 8

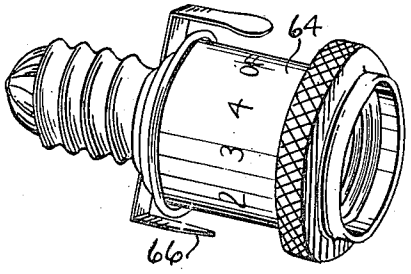
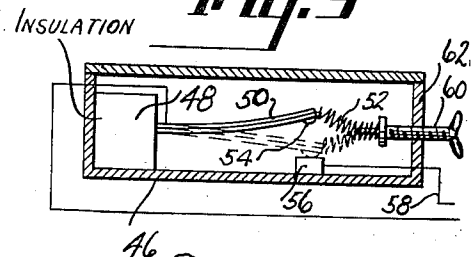


Fig. 9



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Patented Oct. 20, 1936 2,057,696

UNITED STATES PATENT OFFICE

2,057,696

WRITING MACHINE FOR THERMAL RESPONSIVE TRANSFER MATERIAL

John Q. Sherman, Dayton, Ohio

Application January 27, 1934, Serial No. 708,631

33 Claims. (Cl. 197—126)

This invention relates to writing machines and in more particular to writing machines for use with heat responsive transfer material. The conventional transfer material generally referred to as carbon paper is objectionable in that it is smutty and the resulting work produced is oftentimes also smutty due to direct or indirect contact with the transfer material. Various methods have been employed to eliminate this smutty effect of the transfer material, some of which are disclosed in my Patents Nos. 1,864,097, and 1,865,708. In the present disclosure instead of sealing or coating the transfer material, heat responsive transfer material that is homogeneous throughout may be used. This material is fast under normal room temperatures and therefore is not smutty, smeary and transferable without a change in temperature. This transfer material can be used as such only by the application of temperatures higher than or other than ordinary atmospheric temperatures.

An object of this invention is to provide a device for the use of transfer material that is non-transferable at ordinary room temperature but becomes transferable when heated.

A further object of the invention is to provide a heater for the writing machines.

A further object of the invention is to provide a heated platen for a writing machine.

A further object of the invention is to provide a control mechanism for maintaining the heated parts at a predetermined temperature.

A further object of the invention is to provide a thermal responsive cutout for the heating device on the writing machine.

A further object of the invention is to provide a time responsive cutout for the writing machine that cuts out the heater circuit after the writing machine has been idle for a predetermined period of time.

A further object of the invention is to provide a time control means that is responsive to the operation of the writing machine.

A further object of this invention is to provide transfer material that is non-smutty and non-transferable at ordinary room temperature but transferable at some other temperature.

Another object of this invention is to provide adjustable means for adjusting the temperature supplied to the transfer material in response to the demands thereof.

Another object of this invention is to provide a regulator for the heater unit whereby the impressed voltage may be changed to accommodate varying conditions.

The above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

Fig. 1 discloses a schematic plan view of a typewriter provided with a heating unit.

Fig. 2 discloses an end view of the device disclosed in Fig. 1, with parts broken away.

Fig. 3 discloses a sectional view of a rotary platen provided with a heater element.

Fig. 4 discloses a modification of a stationary platen provided with a heater element.

Fig. 5 discloses a cross-sectional view of the stationary heater platen disclosed in Fig. 4.

Fig. 6 discloses another modification of the invention applied to an autographic register or billing machine.

Fig. 7 shows the heater elements applied to a flat bed platen writing machine.

Fig. 8 discloses a voltage regulator or a voltage control.

Fig. 9 discloses an adjustable thermostatic control.

In conventional typewriters using conventional forms of transfer material, so-called carbon copies are made by the type impinging upon the record material and the carbon material to form an impression upon the carbon copy. This is done at ordinary room temperature which necessitates the use of transfer material wherein a wax or oily substance is used to keep the transfer material plastic or transferable at ordinary room temperatures. This transfer material has a number of objections, it being smutty and smeary if sufficiently moist or plastic to properly transfer or copy. In addition to the above disadvantages this transfer material dries out, at which time it is of no value as it fails to copy. In other words only small supplies can be kept on hand as it deteriorates with age.

In the present embodiment, transfer material that is not transferable, smutty or smeary at ordinary room temperature and that does not deteriorate with age has been used. Although the process is applicable to interleaved transfer sheets it is preferably for coating the reverse side of the record sheets so as to eliminate the use of the interleaved transfer sheets. This has been accomplished by providing a heat responsive coating which fuses upon the application of heat higher than ordinary room temperature. The

moisture content of such coating is comparatively low so that at ordinary room temperature the coating is dry, hard and non-transferable. The following coatings have been found suitable although not intended as a limitation but merely as an illustration of the present invention:

No. 1—Black

50 # nitrated cotton solution (approximately 450–700 centipoises for a 25% solution at 15 deg. C.)
1 # fossil gum (Zanzibar copal, Congo copal, Kauri copal, Manila copal)
12 oz. non-drying oil (castor oil)
36 # solvent. Alkyl esters (ethyl acetate, butyl acetate, amyl acetate, butyl propionate)
84 # diluent. Aromatic hydrocarbons (benzol, toluol)
27 # alcohols. Alkyl alcohols (methyl alcohol, ethyl alcohol, amyl alcohol)
20 # carbon black
2 # methyl violet dye
10 # plasticizer (triphenyl phosphate, tricresyl phosphate, dibutyl phthalate)

No. 2—Blue

22 # nitrated cotton solution (approximately 45–60 centipoises for a 25% solution at 15 deg. C.)
32 # polymerized drying oil (polymerized tung—China-wood oil)
50 # solvent. Alkyl esters (ethyl acetate, butyl acetate, amyl acetate, butyl propionate)
50 # diluent. Aromatic hydrocarbons (benzol, toluol)
15 # Milori blue
1 # methyl violet dye
8 # plasticizer (triphenyl phosphate, tricresyl phosphate, dibutyl phthalate)

No. 3—Blue

50 # nitrated cotton solution (approximately 450–700 centipoises for a 25% solution at 15 deg. C.)
1 # fossil gum (Zanzibar copal, Congo copal, Kauri copal, Manila copal)
12 oz. non-drying oil (castor oil)
36 # solvent. Alkyl esters (ethyl acetate, butyl acetate, amyl acetate, butyl propionate)
84 # diluent. Aromatic hydrocarbons (benzol, toluol)
27 # alcohols. Alkyl alcohols (methyl alcohol, ethyl alcohol, amyl alcohol)
20 # Milori blue
2 # methyl violet dye
10 # plasticizer (triphenyl phosphate, tricresyl phosphate, dibutyl phthalate)

Like parts are indicated by similar characters of reference throughout the several views.

Referring to Figs. 1, 2 and 3, portions of a conventional typewriter carriage has been shown in which is mounted a heated platen **10** to the rear of which is found a pair of preheaters **12** and **14**, one mounted above and one mounted below the record material advancing into writing position. To the rear of the typewriter has been shown a stationary time controlled switch **16**. Members **10**, **12**, **14** and **16** will now be described in order.

In the particular modification disclosed, a pin feed platen has been disclosed wherein the feeding pins are actuated in a manner similar to that disclosed in my co-pending application Serial No. 542,855, filed June 8, 1931 for a Pin feed platen roll. A platen without a pin feeding device can be used although a feeding device should be used capable of functioning without pressure on the record and transfer material in the track of the transfer material while it is in a heated state. The interior of the platen **10** is heated by a heater element **18**, mounted intermediate the supports **20** and **22** in the particular embodiment shown, and energized from a pair of leads **24** and **26** passing through suitable apertures **28** and **30** in the support **20** and terminating in the slip rings **32** and **34** carried by the platen shaft **36**. The slip rings **32** and **34** are insulatingly mounted upon the shaft **36** and in fixed relation thereto so that the slip rings **32** and **34**, the shaft **36**, the platen **10**, and the heater element **18** all rotate in unison. Suitable brushes **38** and **40** energized from a suitable source of electric power contact the slip rings **32** and **34** so as to energize the heater element **18**.

The rate at which the record material advances through the writing machine depends entirely upon the operator and the nature of the work. This influences the rate of radiation of heat from the platen. In addition thereto the terminal voltage and the temperature of the atmosphere exerts influence upon the temperature of the platen. In the present embodiment a thermostatic cutout **42** is mounted upon a suitable collar **44** carried by the platen **10**. When the temperature within the platen reaches a predetermined value the thermostatic cutout **42** will automatically open-circuit the heater coils until the temperature of the platen drops to a predetermined value at which time the circuit is again closed and the heating of the platen resumed.

The thermostat disclosed in Fig. 3 has been schematically shown. A detail disclosure of a suitable thermostat is shown in Fig. 9. It includes the base **46** preferably carried by the collar **44**. Mounted thereon is an insulating support **48** carrying a bimetallic thermostat element **50** flexed in the up-position, as disclosed in Fig. 9, when the temperature reaches a predetermined value influenced by the magnitude of the pressure exerted by spring **52**, and into down-position, shown in dot-dash, when the temperature drops to a predetermined value, at which time the contact **54**, energized through member **50** and lead **55**, engages a fixed contact **56** connected to the lead **58**. It has been found that the temperature required for some types of material is not the same as the temperature required for other types of heat responsive material. This being the case it is very desirable to have a variable thermostat to accommodate varying conditions. This has been accomplished in the modification disclosed by the adjustable screw **60** mounted in the flange **62**. By adjusting the screw **60** the tension of the spring **52** is changed, thereby changing its force applied to the thermostatic element **50**. If it is desirable to raise the temperature of the platen the tension of the spring **52** may be tightened so as to prevent the bi-metallic element **50** from releasing until the temperature has increased considerably and vice-versa. The screw **60** has been arranged in offset relation from the fixed axis of the thermostatic element so that as the screw **60** is adjusted its pressure influences the opening of the circuit more so than the closing thereof.

A variable rheostat **64** shown in Fig. 8 is preferably connected in series with the input leads of the writing machine which may be set so as to prevent the frequent operation of the thermostat **42**. This variable rheostat **64** is preferably graduated and provided with suitable indicia to

correspond with variable grades of transfer material. For example the rheostat 64 may be so calibrated that the indicia 3 registers with the pointer 66 for a transfer material requiring 180° and so that the indicia 2 registers with the pointer 66 when record material requiring only 160° temperature is used. These values are merely used to illustrate the operation of the device and not as a limitation.

The heat supplied by the platen may not be sufficient to raise the transfer material to the required temperature, especially if the record material and transfer material are advanced past the platen very rapidly. Preheaters 12 and 14 have been disclosed for heating the transfer material in advance of the platen. The length of the contacting heater surface exposed to the transfer material may be selected by changing the size of the preheaters to meet the particular demands. Each of the preheaters have been provided with heater elements 18 and thermostatic cutouts 42 as shown schematically in Fig. 2. The preheaters may be connected either in parallel or in series with the platen and with one another. In the particular modification disclosed in Fig. 1 the preheater 12 is connected in series with the preheater 14 but in parallel with the heater element 18 found in the platen 10.

A time control switch 16 has been mounted in a fixed relation upon the typewriter. This time control switch automatically open-circuits the heater elements after a predetermined interval of time so that if the writing machine is abandoned by the operator for any length of time the power is automatically cut off. The details of this time control switch will not be described at this time for the reason that it is fully described in my Patent No. 1,850,421, excepting that instead of being manually operable, as disclosed in my patent, it is operated in response to the transverse movement of the carriage of the typewriter. A member or bumper 71, carried by the carriage of the typewriter and adjustably mounted on the rack bar 72, actuates the reciprocatory ratchet bar 74 whenever the carriage of the typewriter approaches one end of its travel so that the time control switch 16 is automatically wound each time the carriage approaches one end of its travel. Member 71 may be adjusted on the rack bar 72 to agree with the adjustment of the marginal indicator 76 mounted thereon. For convenience member 71 has been mounted upon one marginal indicator 76 in the particular modification shown. If the writing machine is abandoned for a considerable length of time and the rack bar 74 is not actuated, the time control switch 16 automatically open-circuits the heater elements thereby preventing a waste of energy and decreasing the fire hazard.

Where pin wheel feed devices are used and spaced away from the platen the preheater 12 and the platen 10 may be united. This has been disclosed in Figs. 4 and 5. In this modification a platen 70 is shown substantially pear-shaped. It and its heater element 18 do not rotate.

The pin wheel feeding device 72 is mounted for rotation adjacent opposite ends of the platen and carried by the shaft 74. The cams 76, which are similar to the cams disclosed in my above referred to application Serial No. 542,855, are so positioned as to project the pins in the proper relation with respect to the writing position and the path of the record material to properly present the same to the platen. The cams 76 are preferably mounted upon a stationary sleeve 78, rotation of which is prevented by the stop 80 engaging the ratchet 84. The pins are rotated with the shaft 74. Driving member 86 which rotates the pins, disclosed to the left of Fig. 4, drives the tubular sleeve 88 rotatably journaled in the platen 70. As the sleeve 88 is rotated in response to the shaft 74 through member 86 fixedly carried by the shaft 74, the pins to the right, as disclosed in Fig. 4, are rotated in unison with the pins disclosed to the left thereof. A suitable preheater 14 similar to one of the preheaters disclosed in Fig. 2, is mounted adjacent to a portion of the platen 70.

In the modification disclosed in Fig. 6 a flat bed table 90 of an autographic register 94 is provided with a heater 96 for heating the table so as to supply heat to the heat responsive transfer material overlying the writing table. The heater element 96 is connected in series with a thermostatic cutout 42 and insulatingly isolated from the record material magazine 98. This is to prevent the heat responsive transfer material within the magazine 98 from softening and smearing or smutting the record material. In this modification the time control switch 16 has been fixedly mounted upon the autographic register and the rack bar 74 reciprocated once for every revolution of the pin wheel feed 100 which usually revolves through one revolution when the used form is ejected and a new form advances into writing position. Thus it is seen that the autographic register is provided with a device for heating the writing table from which advances the record material with the heat responsive transfer material; is provided with a thermostatic cutout which open-circuits the heater coil when the record material overlying the writing tablet reaches a predetermined temperature; and is provided with means for automatically open-circuiting the heater element after the autographic register has been abandoned for a predetermined interval of time. A rheostat for supplying suitable voltage for the requirements of the heater elements may be connected in series therewith.

In Fig. 7 a flat bed writing machine has been disclosed wherein the heater elements 18 underlie the writing platen 102 over which advances a writing machine 104. The heater element is also controlled by the thermostatic device 42, the voltage reduced by a rheostat, not shown. The circuit is interrupted by a time control switch, not shown, after the lapse of a predetermined period of non-use.

In each of the modifications described above, electric heater elements have been disclosed. However, instead of electrically heated platens and preheaters and electric heating elements in writing tables, these could be heated by steam or gas where such sources of heat are found more convenient than the use of electricity. Likewise any other suitable source of heat may be used within the purview of this invention.

From the above description it will be apparent that there is thus provided a construction of the character described, possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions and arrangement of parts, without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention is described in language more or less specific as to structural features, it is to be un-

derstood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. The combination of a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, having a platen with a heater unit for supplying heat to the transfer material so as to make the coating available for transfer, any portion of which may be transferred only while being written upon.

2. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, the combination with a platen of a heater unit mounted in said plate for supplying heat to the transfer material so as to make the coating transferable for the transfer of any selected portion thereof while passing through the writing machine.

3. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, the combination of a platen with a heater unit located in said platen, said heater unit including means for controlling the temperature of the platen within the range of temperatures required to make the heat responsive transfer coating ready for transfer of any selected portions in writing position.

4. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, the combination of a platen, of a heater unit associated with said platen for supplying heat to the transfer material to make the coating ready for transfer of any selected portion thereof, and means for controlling the temperature of the heater unit, within the range wherein the heat responsive transfer material is transferable, while passing the writing position of the machine.

5. A writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, including a platen and a pair of heater units arranged in spaced relation with respect to the platen for supplying heat to the heat responsive transfer material to make the coating ready for transfer of any selected portion thereof.

6. A writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperatures, including a platen, a heating unit in the platen for making the coating ready for transfer of any selected portion thereof, and time control means associated therewith for interrupting the operation of the heating unit.

7. A writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, including a platen, a heater unit associated with said platen for making the coating transferable whereby any selected portion thereof in proximity to the platen may be transferred, means for controlling the temperature of the heating unit, and time control means for interrupting the operation of the heating unit after a predetermined period of non-use of the writing machine.

8. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, the combination with a heater unit for making the coating ready for transfer of selected portions thereof of a thermostatic control for maintaining the temperature of the heater unit within the transferable range of temperature of said transfer material.

9. In a writing machine for use with a sheet having a coating of heat responsive material normally non-transferable at ordinary temperature, the combination of a platen, of a heater unit associated with said platen for supplying heat to the transfer material to make the coating ready for transfer of selected portions thereof, and means for limiting the temperature of the heater unit to the lowest range possible at which heat responsive material may become transferable while passing through the writing position of the machine, below which heat range the transfer material is non-transferable.

10. A writing machine for use with heat responsive material normally non-transferable at ordinary temperature, including a platen, twin heater units arranged in spaced relation with respect to said platen and with respect to each other for supplying heat to both sides of the heat responsive transfer material passing between them.

11. A writing machine for use with a sheet having a coating of heat responsive transfer material that is non-transferable at ordinary room temperature, including a platen, a heater unit associated with the platen for supplying heat to the transfer material so as to make it transferable throughout an extended area, any selected portion of which may be transferred, a time control means controlled by the operation of the writing machine for automatically maintaining the heating unit heated during the operation of the machine.

12. A writing machine for use with a sheet having a coating of heat responsive material normally non-transferable at ordinary temperature, including a platen, and heater unit associated with said platen, to make the coating transferable throughout an extended area any selected portion of which may be transferred, means for controlling the temperature of the heating unit, switch means for supplying heat to the heating unit, and means for controlling the amount of heat supply to the heating unit.

13. A writing machine for use with heat responsive transfer material normally non-transferable at ordinary temperature, including a platen, non-frictional feeding means for the transfer material for feeding without frictional or pressure contact, a heater unit associated with said platen, and means for controlling the temperature of the heating unit.

14. A writing machine for use with forms having interleaved sheets of heat responsive transfer material normally non-transferable at ordinary temperature, including a platen, means for marginally feeding the forms past the writing position without frictional or pressure contact, a heater unit associated with said platen, and means for controlling the temperature of the heating unit.

15. In a writing machine for use with forms having interleaved sheets coated with heat responsive transfer material normally non-transferable at ordinary atmospheric temperature, the combination of a platen, of a pin wheel feed for

feeding the forms past the platen, and a heater unit located in said platen for supplying heat to the heat responsive transfer material to make an extended area thereof transferable, any selected portion of which may be transferred.

16. In a writing machine for use with a sheet having a coating of heat transfer material normally non-transferable at ordinary atmospheric temperature, the combination of a platen, a pin wheel feed for feeding the transfer material past the platen, and a heater in spaced relation with said platen for supplying heat to said transfer material whereby any selected portion of the heated area may be transferred at the platen, said heater unit having a thermostat control for regulating the heat to be supplied to said heater unit.

17. A writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, including a platen, a pin wheel feed for feeding the transfer material past said platen, an electric heater unit associated with said platen, said electric heater unit supplying heat to the transfer material so as to make it transferable when passing the writing position of the machine so that any selected portion may be transferred, means for maintaining an even temperature of heat in the electric heating unit, means for automatically supplying and cutting off the current to the electric heating unit, and means for controlling the supply of electric current to the heater.

18. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary temperature, the combination of a platen, a heater unit associated with said platen for making the coating in proximity thereto transferable, any portion of which may be transferred and a time switch through which heat is supplied to the platen, said time switch being normally kept in closed position by the operation of the machine, said switch automatically opening when the operation of the machine is discontinued.

19. In a writing machine for use with heat responsive material non-transferable at ordinary atmospheric temperature, the combination of a heater unit relatively associated with the platen for supplying heat to the heat responsive transfer material with means for feeding the record material past the platen without affecting the transfer of the transfer material by the action of said feeding means.

20. In a writing machine for use with heat responsive transfer material normally non-transferable at ordinary atmospheric temperature, the combination of a platen with a heater unit associated with the platen for supplying heat to the heat responsive transfer material, and means for feeding the record material past the platen without effecting the transfer of the transferable material.

21. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally nontransferable at ordinary atmospheric temperature, including a platen, nonfrictional feeding means for the transfer material for feeding the same without frictional or pressure contact, and a heater unit associated with said platen to make the coating of the transfer material transferable throughout an extended area any portion of which may be transferred.

22. In a writing machine for use with a sheet having a coating of heat responsive transfer material normally non-transferable at ordinary atmospheric temperatures, including a platen, means engaging the margins of the transfer material for feeding it past the platen, and heater means associated with the platen to make the transfer material transferable throughout an extended area, any selected portion of which may be transferred.

23. In a writing machine, having a writing position, for use with a sheet having a coating of heat responsive transfer material normally nontransferable at ordinary atmospheric temperatures, including means for feeding the transfer material, and means associated with the writing position for making an extended area of the transfer material transferable, any selected portion of which may be transferred.

24. In a manifolding appartus the combination with material feeding means for progressively advancing superposed strata of record material and an interposed stratum of normally inert transfer material in unison with each other past the writing position of a writing machine, of activating means associated therewith for activating a progressively changing area of the stratum of inert transfer material prior to reaching the writing position and imprinting means for effecting transfer at the writing position of restricted portions of the activated area to an adjacent stratum of record material.

25. In a manifolding apparatus the combination with material feeding means for progressively advancing superposed strata of record material and an interposed stratum of normally inert transfer material past a writing position, thermal activating means by which a progressively changing area of the inert stratum of transfer material is activated preparatory to a writing operation and impact means for successively transferring portions of the activated area thereof to an adjacent record material stratum.

26. An apparatus for utilizing a manifolding assembly wherein a stratum of normally inert thermal responsive transfer material is interposed between superposed strata of record material, including means for progressively advancing the manifolding assembly past a writing position, thermal activating means to the influence of which the interposed stratum of transfer material is progressively subjected during its advance to writing position, and imprinting means for effecting transfer of restricted portions of the activated area of said stratum of transfer material onto an adjacent stratum of record material.

27. An apparatus for utilizing a manifolding assembly wherein a stratum of normally inert transfer material is interposed between superposed strata of record material including means for progressively advancing the manifolding assembly past a writing position, activating means associated therewith in offset relation with the writing position for temporarily activating a portion of the stratum of transfer material during its advance to the writing position, and imprinting means effecting transfer of restricted areas of the activated portion of the transfer stratum onto an adjacent stratum of record material.

28. In a manifolding apparatus, the combination with a writing machine of manifolding material feeding means for progressively advancing past a writing position superposed record sheets having interposed there between a stratum of normally inert percussion responsive transfer material, heating means establishing a thermal zone through which the material is passed to the

writing position by the feeding means and within which the transfer material is thermally conditioned, and percussion means for transferring the preconditioned material onto an adjacent record sheet.

29. In a manifolding apparatus for use of material wherein a normally inert stratum of thermal sensitive percussion motivated transfer material is interposed between superposed record sheets, a writing machine, material feeding means for advancing the manifolding material past a writing position, temperature control means establishing a preconditioning zone through which the material is advanced to the writing position by the feeding means and percussion means for effecting transfer of the preconditioned transfer material from said stratum to an adjacent record sheet.

30. A manifolding apparatus for use of material wherein a normally inert stratum of transfer material is interposed between superposed record sheets, a writing machine having a writing position, feeding means for progressively advancing the record material past the writing position, transfer material conditioning means associated with the writing machine affording a pre-conditioning zone within which the normally inert transfer material is activated preparatory to transfer of restricted portions of the transfer area thereof to an adjacent record sheet by the operation of the writing machine.

31. In a manifolding apparatus for use of manifolding material wherein a normally inert stratum of transfer material is interposed between superposed record sheets, a writing machine having a writing position past which the assembly of record and transfer material is progressively advanced, means for advancing the assembly of material, and activating means for the transfer material affording a conditioning zone through which the transfer material is advanced and within which the transfer material is energized and means for effecting transfer of successive restricted portions of the energized area of the transfer stratum to an adjacent record sheet.

32. In a manifolding apparatus for use of manifolding material wherein a normally inert stratum of transfer material is interposed between superposed record sheets, a writing machine having a writing position past which the assembly of record and transfer material is progressively advanced, activating means associated with the writing machine for conditioning the normally inert transfer material for transfer to an adjacent record sheet, and means for advancing the record and transfer material respectively past the writing position and said activating means, and impression making means for effecting transfer of restricted areas of the conditioned transfer stratum to an adjacent record sheet.

33. A writing machine for use of manifolding material wherein a stratum of normally inert transfer material is interposed between superposed sheets of record material, said writing machine having a writing position, material feeding means for progressively advancing the record material past the writing position, and activating means for the transfer material establishing a conditioning zone within which the normally inert transfer material is activated preparatory to transfer of restricted portions of the stratum of transfer material to an adjacent record sheet by the operation of the writing machine.

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