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2,751,310

TRANSFERABLE MARKING COMPOSITION FOR FACSIMILE TRANSMITTING BLANKS AND TRANSMITTING BLANKS

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No Drawing. Application January 20, 1951, Serial No. 207,064

6 Claims. (Cl. 117—37)

This invention relates to the telegraphic facsimile transmission of messages from a transmitting blank by means of an electrical stylus which scans the blank, and more particularly to an improved transferable marking composition for delineating the subject matter on such a transmitting blank. The instant invention is particularly adaptable for use in the preparation of a facsimile message transmitting blank and in the method of producing facsimile message signals such as disclosed in the Kline Patent No. 2,572,871, issued October 30, 1951, the disclosure of which is incorporated herein by reference.

As in the aforesaid Kline patent, the present invention enables transmitting and/or recording facsimile apparatus to be employed in the offices of firms and business houses which do not have a sufficiently high daily volume of telegraph business to justify the cost of installing and maintaining send-receive telegraph printers or conventional facsimile send-receive apparatus, and yet whose telegraph business is too large to rely on messenger pickup and delivery for telegrams transmitted and received. Facsimile apparatus suitable for use with the instant invention is sufficiently simple and inexpensive so as to justify the use of the same to handle the business of patrons having comparatively small telegraph accounts. Moreover, the invention enables a facsimile transmitting blank readily to be produced, which blank may be utilized not only with alternating current pickup but also with a low voltage direct current pickup. The blank may be prepared with a minimum of skill and experience; any typist can prepare the facsimile transmitting blank in the same manner as when making carbon copies of letters on a typewriter, simultaneously with the production of a ribbon copy and carbon copies of a message. Any ordinary typewriter, without any changes or additions thereto and without requiring special ribbons or inking devices, may be used to prepare the transmitting blank by usual typing methods. For the reception of facsimile messages on the transmitter-recorder, conventional electrosensitive recording blanks may be utilized.

The characters or other subject matter to be transmitted are formed by impressing a suitable dielectric substance upon selected elemental areas of a facsimile transmitting blank which may comprise a sheet of paper or other suitable flexible material. This paper sheet, or at least the transmitting surface portion thereof, is made conductive in order to provide a conductive path for the transmitting stylus current. In preparing the transmitting blank, the upper, or transmitting, surface has superimposed thereon a sheet of paper having on the under surface thereof a transferable coating of the dielectric substance, and pressure exerted by means of a pencil or other marking stylus when writing the subject matter on the upper uncoated surface of the transfer sheet causes transfer of the coating to the adjoining surface of the transmitting blank and impresses thereon insulating characters corresponding to those written on the transfer sheet. Usually, the transmitting blank is prepared on a typewriter in which the transmitting blank and the superimposed transfer sheet

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are inserted, the sheets passing between the typewriter platen and the paper and line guides, and insulating characters are impressed on the upper surface of the transmitting blank as the letters of the telegram or other message are struck by the type bars of the typewriter. These type bars strike a conventional typewriter ribbon against the uncoated surface of the transfer sheet and impress thereon the characters carried by the type bars, and the corresponding dielectric characters are impressed upon the transmitting blank. When the transmitting stylus engages the dielectric characters or other subject matter impressed upon the surface of the transmitting blank which is made conductive, the stylus circuit is interrupted and current does not flow therein so long as the stylus is in contact with the insulating characters or other subject matter, whereby there are transmitted facsimile signals representative of the subject matter being scanned by the transmitter.

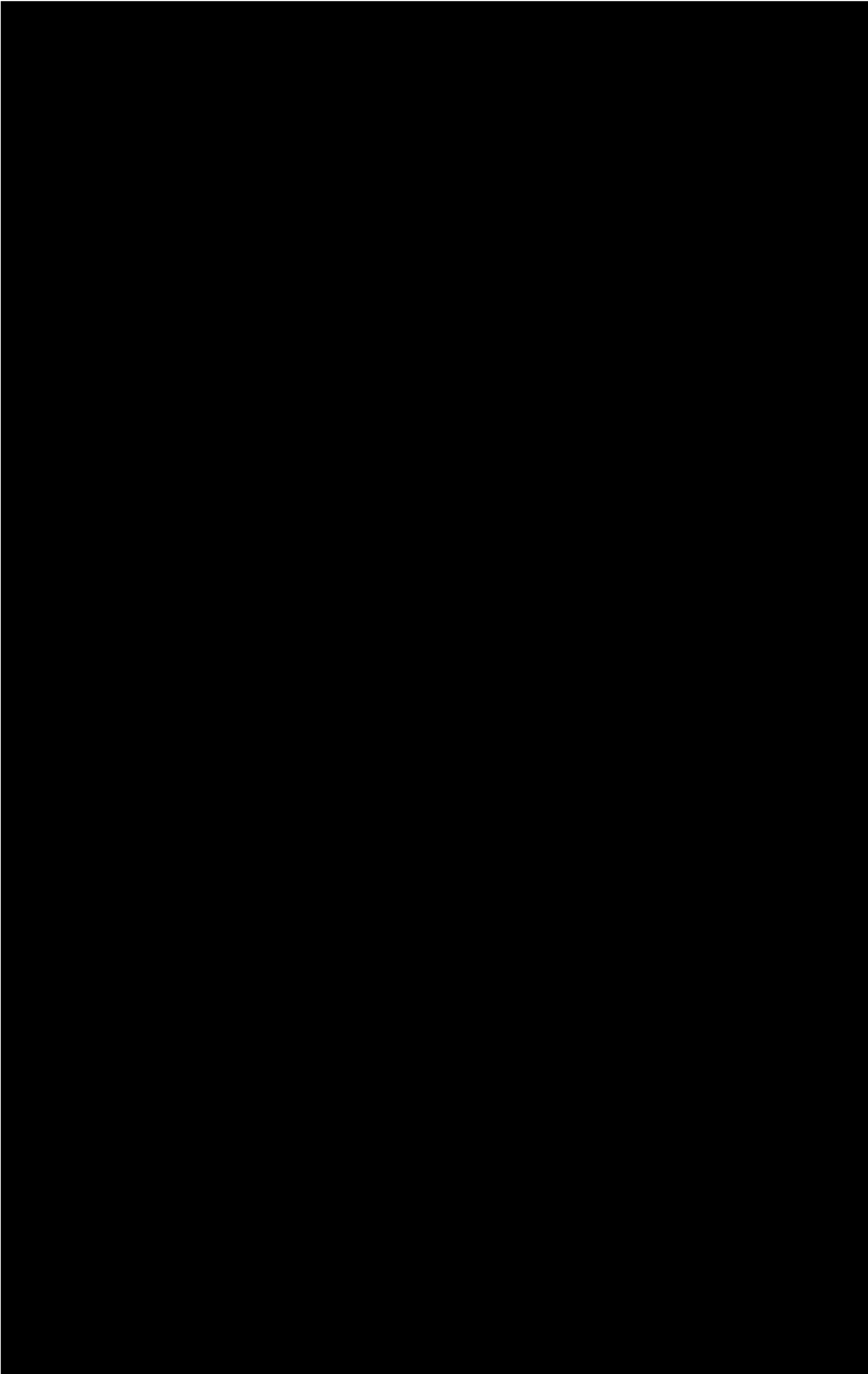
It has been found that for commercial use a waxy transferable marking composition is preferable for delineating the subject matter on the facsimile transmitting blanks, and waxy compositions for this purpose heretofore have been developed, such as those disclosed in the said Kline patent. However, with such compositions it was found necessary to employ at least two different formula variations of the wax because of the wide range of pressure impacts encountered in commercial service. For example, with a given wax formerly employed, it was found that with a light typing impact, such as produced by a noiseless typewriter, the character impressions would be very light so that insufficient wax would be transferred from a wax-coated sheet to the transmitting blank, whereas with the heavy touch characteristic of the standard typewriter the pressure impacts were heavy and tended to produce hollow characters with objectionable spreading at the edges thereof. It was proposed to overcome these difficulties by supplying transfer sheets having coatings of a softer wax composition for light touch and other transfer sheets having coatings of harder wax compositions for the heavy touch. This required stocking two different types of transfer sheets in the customers' offices and also gave rise to annoyance on the part of the customer when a supply of one kind became depleted or, as sometimes happened, when the typist employed the wrong kind of transfer sheet for the machine at the time being used.

It is an object of the present invention to provide a transferable marking wax composition which may be used equally well whether a light touch or a heavy touch typewriter is employed for producing a facsimile message transmitting blank, so that only one type of transfer sheet is required to be supplied to and kept by the customer.

Another object of the invention is a transferable wax composition of the character described which is composed of multiphase lubricated large-crystal structure.

A further object is to provide a facsimile transmitting blank having the subject matter delineated thereon by elemental areas of a wax composition that gives improved transmitting characteristics to the blank.

As disclosed in the aforesaid Kline patent, the paper sheet which comprises the transmitting blank, or at least the transmitting surface portion thereof, may be made conductive, either by incorporating in the paper pulp or by impregnating or coating the paper sheet with, a suitable electrolyte or a finely divided conducting material uniformly dispersed throughout the paper or the surface thereof, after which the characters comprising the message are impressed on the surface of the blank so that they form insulating characters on a conductive background. As an alternative, the transmitting blank initially may be nonconductive, as in the case of ordinary paper stock, and after the insulating characters are impressed thereon, the blank is made conductive by applying thereto



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5 nition than was obtainable from a transmitting blank on which the subject matter was delineated by wax compositions heretofore employed. In the instant case, the ingredients retain substantially the hardness of the original crystals since they are substantially insoluble in the oil phase.

In the manufacture of the transfer sheets, a coating of the instant composition is formed by heating the composition until it is melted and liquefied, after which it is applied by well known coating techniques to the transfer sheets and allowed to cool slowly. Upon cooling, the crystals separate from the oil and grow to comparatively large size, this separation being due to the relative insolubility of the waxes in the oil and in each other.

In accordance with the instant invention, the insulating wax composition consists essentially of stearic acid, carnauba wax, mineral oil, and a suitable pigment. The stearic acid and the carnauba wax form the crystalline structure hereinbefore described; the mineral oil provides the lubricating phase for the wax crystals and also the pigment; and the pigment contributes to the toughness, hardness and durability of the resulting film generally in the manner of pigments employed in paint. A formula which produces a wax composition having the desired characteristics is as follows, all parts being by weight:

	Parts
Stearic acid.....	19-21
Carnauba wax.....	9-11
Mineral oil.....	11-13
Pigment.....	14-16

A preferred formula is as follows, all parts being by weight:

	Parts
Stearic acid (double pressed).....	10
Carnauba wax (#3 refined).....	5
Mineral oil—lubricating grade (SAE-10 to SAE-30).....	6
Zinc sulphide or lead chromate.....	7½

With regard to the two waxes employed, the stearic acid crystals are softer than the carnauba crystals, and the foregoing combination and the proportions used give the proper balance for the optimum hardness throughout the range of operating conditions encountered in commercial service, and these proportions are fairly critical, as are also the proportions of the mineral oil and the pigment, although the proportions of the latter two ingredients are not as critical as those of the waxes referred to. With a suitable pigment, for example zinc sulphide or lead chromate, the wax composition will be light in color so that the impressed dielectric characters stand out in sharp contrast to the black surface of a carbon-impregnated transmitting blank. The composition may, of course, be tinted to some other desired color by employing other pigments, or coloring materials in addition to the pigment employed.

As hereinbefore stated, the transmitting blank may be made conductive by impregnating it during the scanning operation of the transmitting stylus, with various salts which are conductive in non-aqueous solutions, and in which the solubility of such salts in a volatile liquid such as an alcohol makes possible their use, as disclosed in Patent No. 2,181,533, issued November 28, 1949. A solution of one of the salts in an alcohol may be applied locally ahead of the stylus in the manner set forth in the aforesaid patent, and this method is suitable when a wax composition such as that disclosed herein is employed for forming the dielectric characters since such composition has the property of repelling liquids such as alcohol, and thereby the transmitting paper blank is made conductive except in those elemental areas where the insulating characters have been impressed.

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For brevity, the expression "is made conductive" is employed in a generic sense in the claims, wherever applicable, to define a blank or sheet which is made conductive either initially or after the message characters to be transmitted are applied thereto.

What is claimed is:

1. A facsimile message transmitting blank comprising a base sheet having a surface adapted to be scanned by an electrical stylus of a facsimile transmitter, the surface of said sheet having applied thereto message characters composed of an insulating composition which adheres to said surface and provides insulating characters thereon, whereby if the sheet is made conductive the current in the stylus circuit is interrupted when the stylus passes over the insulating characters, said insulating composition when applied consisting essentially of the following formula, all parts being by weight:

	Parts
Stearic acid.....	19-21
Carnauba wax.....	9-11
Mineral oil, viscosity approximately SAE 10 to 30.....	11-13
Pigment.....	14-16

2. A facsimile message transmitting blank comprising a fibrous base sheet having a surface adapted to be scanned by an electrical stylus of a facsimile transmitter, the surface of said sheet having applied thereto message characters composed of an insulating composition which adheres to said surface and provides insulating characters thereon, whereby if the sheet is made conductive the current in the stylus circuit is interrupted when the stylus passes over the insulating characters, said insulating composition when applied consisting essentially of the following formula, all parts being by weight:

	Parts
Stearic acid, double pressed.....	10
Carnauba wax.....	5
Mineral oil, viscosity approximately SAE 10 to 30.....	6
Zinc sulphide.....	7-8

3. A transferable marking composition for delineating subject matter on a facsimile transmitting blank and consisting essentially of the following formula, all parts being by weight:

	Parts
Stearic acid.....	19-21
Carnauba wax.....	9-11
Mineral oil, viscosity approximately SAE 10 to 30.....	11-13
Pigment.....	14-16

4. A transferable marking composition for delineating subject matter on a facsimile transmitting blank and consisting essentially of the following formula, all parts being by weight:

	Parts
Stearic acid.....	19-21
Carnauba wax.....	9-11
Mineral oil, viscosity approximately SAE 10 to 30.....	11-13
Zinc sulphide.....	14-16

5. A transferable marking composition for delineating subject matter on a facsimile transmitting blank and consisting essentially of the following formula, all parts being by weight:

	Parts
Stearic acid, double pressed.....	10
Carnauba wax.....	5
Mineral oil, viscosity approximately SAE 10 to 30.....	6
Pigment.....	7-8

6. A transferable marking composition for delineating subject matter on a facsimile transmitting blank and con-

sisting essentially of the following formula, all parts being by weight:

	Parts		1,573,174
			1,622,353
			1,688,117
Stearic acid	19-21		1,714,166
Carnauba wax	9-11	5	1,954,451
Mineral oil, viscosity approximately SAE 10			1,988,723
to 30	11-13		2,327,854
Lead chromate	14-16		2,519,321
			2,572,871
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