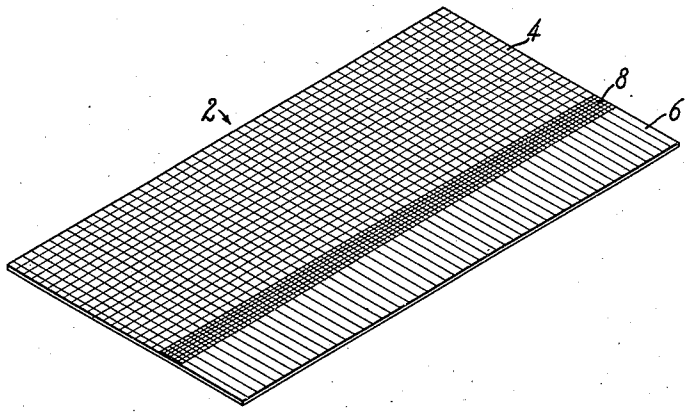
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INK TRANSFER RIBBON

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INK TRANSFER RIBBON

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This invention relates to ink transfer ribbons such as are used in adding machines, check protecting machines, typewriting machines and various other business machines having printing or typing mechanism. More particularly the invention relates to bicolor transfer ribbons for printing or typewriting mechanisms.

The primary object of the invention is to produce an ink transfer ribbon having inks of different colors upon adjoining portions in which there is no discoloration of the different portions of the ribbon produced by transfusion of ink from one portion to another of the ribbon.

Another object of the invention is to produce a bicolor ink transfer ribbon having ink of a relatively dark color upon one portion thereof, and ink of a relatively light color upon an adjoining portion in which there will be no running or transfusion of the ink of the darker color into the ink of the lighter color along the line of separation of the two inks.

The various features of the invention will be clearly understood from the accompanying drawing illustrating a ribbon embodying the invention and the following detailed description of the invention.

When inks comprising a non-drying oil and pigment colors insoluble in the oil are employed in a bicolor transfer ribbon, there will be substantially no transfusion of the inks along the adjacent margins of the inked portions.

In order to increase the intensity, density and durability of inks for transfer ribbons, a solution of aniline dye or color in oil such as a fatty acid solution is added. When inks containing oil soluble colors, forming solutions of the coloring materials or dyes in the oil of the inks, are used in one or both of the adjoining differently inked portions of a bicolor ribbon, there is a great deal of transfusion or running together of the inks along the adjacent margins of said portions with the result that one or both the inks are discolored and the brighter color may be completely or partially destroyed along the original line of demarkation.

In the drawing, the figure is a perspective view of a section of bicolor ribbon embodying the invention.

The drawing illustrates the invention as embodied in a ribbon particularly for use in connection with printing mechanisms for check protecting machines.

The section of ribbon illustrated in the drawing and indicated as a whole at 2 comprises a woven fabric or other suitable tape or ribbon material impregnated or otherwise inked with inks of different colors along strips extending longitudinally of the ribbon. The relatively wide longitudinal strip 4 of the ribbon is impregnated with ink of one color comprising non-drying oil or oils and coloring material and containing an oil solution of an aniline die or other suitable coloring matter soluble in the oil. The narrower strip 6 of the ribbon is impregnated with ink of another color. This ink also comprises non-drying oil and coloring material and the coloring matter employed may be insoluble in oil so that the ink contains no oil solution of coloring material. This strip, however, may be inked with an ink containing oil soluble aniline or other dye, the ink having therein an oil solution of the dye.

Intermediate between strips 4 and 6 is a still narrower strip 8 adjoining the strips 4 and 6 and impregnated with ink preferably of substantially the same color as the strip 4. This ink also comprises a non-drying oil or oils and coloring material but the coloring material employed consists of a pigment or pigments insoluble in oil so that the ink contains no solution of coloring material.

With a ribbon constructed as above described, the ink from the strip 4 and particularly the solution of dye in the oil of said ink will spread or run into the intermediate strip 8. Because of the fact that the ink of the strip 4 is of substantially the same color as the ink of the strip 8, the running of the ink from the strip 4 into the strip 8 will produce no disadvantageous results but will merely increase the strength or intensity of the color of the ink in the strip 8. Since the strip 8 contains no oil soluble coloring material and no solution of the coloring matter in oil, the ink of said strip will not run into or interfuse with the ink of the strip 6. For the same reason, the ink of the strip 8 will not interfuse with or run into the ink of the strip 4. When an ink is used in the strip 6 in which the coloring materials are insoluble in oil, there will be no running of this ink into the ink of the strip 8. In the case in which an ink is employed in the strip 6 containing oil soluble colors, the ink of this strip will interfuse with or run into the ink of the strip 8. This, however, will produce no disadvantageous results, when the ink of the strip 6 consists of a relatively light color such as red and the ink of the strip 8 consists of a relatively dark color such as dark blue or black, inasmuch as the color of the lighter ink will be destroyed or "killed" by the dark color of the ink in the strip 8.

The width of the intermediate strip 8 containing no oil soluble color may be varied as required to produce the most advantageous results and its width may also be varied with the width of the ribbon. As above stated, the invention is shown in this application as embodied in a ribbon particularly intended for use in check protecting machines. This ribbon is several inches in width and the width of the strip 8 is preferably about ⅜ of an inch. This width is slightly greater than the distance which the ink of the strip 4 will interfuse with or run into the strip 8 so that there is no liability that the ink from the strip 4 will run beyond the strip 8 into the strip 6.

When the invention is embodied in a typewriter ribbon, the entire width of the ribbon will be only a fraction of the width of the ribbon shown in the drawing of this application and the width of the intermediate strip will have to be much narrower than that of the strip 8 of the illustrated ribbon.

The inks of the strips 4 and 8 preferably have a dark blue or black coloration and ink of a red color is preferably employed upon the strip 6 to form the usual bicolor combination.

For a bicolor ribbon made in accordance with the invention, a black ink may be employed on the strip 4 containing a non-drying oil or a mixture of non-drying oils and certain coloring pigments such as carbon black existing in suspension in the non-drying oil or oils. This ink also contains a solution in oil of an oil soluble coloring material such as an oleic acid solution of an aniline dye. For example, the ink may consist of butyl ester of castor oil, 25 parts, oleic acid, 20 parts, carbon black, 6 parts, and nigrosine base, 9 parts. In the formulas given in this application, the ingredients of the several compounds are given in their proportions by weight. Instead of the butyl ester of castor oil, lard oil, 13 parts, and tri-cresyl phosphate, 12 parts, may be employed in the composition, and the following proportions of the other materials are used: oleic acid, 20 parts, carbon black, 5 parts, and nigrosine base, 10 parts. In either composition the ink contains a solution of the nigrosine base in oleic acid.

In a bicolor ribbon in which red ink having no oil soluble coloring materials is applied to the ribbon along the strip 6, the ink may be made up of petrolatum oil, 18 parts, lard oil, 18 parts, blown rape oil, 18 parts, and lithol red toner, 19 parts. Since this ink does not contain any oil soluble coloring material there will be no running of the red ink into the ink of the strip 8.

A red ink may be applied to the strip 6 similar in general composition to the black ink for the strip 4 except that it contains a solution of a red coloring material in oil. That is, the red ink may contain a non-drying oil or oils together with a red pigment and a solution in oil of a red dye. For example, the ink may consist of butyl ester of castor oil, 13 parts, tri-cresyl phosphate, 12 parts, oleic acid, 20 parts, lithol red, 15 parts, and rhodamine base, 4 parts. Thus this composition contains a solution in oleic acid of the rhodamine base. When this composition is used for the red ink, there will be a considerable running of the red ink into the black of the intermediate strip 8. The strong color of the ink of the strip 8, however, will destroy or "kill" the effect of this transfused red ink so that it will make no difference in the color of the imprint produced from the intermediate strip.

The ink of the intermediate strip 8 consists of a suitable non-drying oil or mixture of oils and a coloring pigment or pigments in suspension in the oil, this ink containing no oil soluble coloring material. Thus this ink may be made up of peanut oil, 5 parts, lard oil, 5 parts, blown rape oil, 5 parts, carbon black, 3 parts, and Prussian blue, 3 parts.

With a bicolor ribbon inked with the several inks above described, the black ink from the strip 4 will transfuse with the ink of the strip 8. Since the ink of the strip 8, however, contains no oil soluble colors or coloring material, there will be no running of this ink into the strips 6 and 4.

The ink of the strip 8 may contain various other materials, provided in all cases, however, that it does not contain oil soluble coloring material or a solution of coloring material in oil. For example, this ink may be made up of butyl ester of castor oil, 8 parts, Dow plasticizer #5, 8 parts, carbon black, 3 parts, and alkali blue, 3 parts.

It is to be understood that the invention is not limited to compounds having the particular ingredients or proportions of ingredients given in this application, but that both the ingredients and their proportions may be varied to suit various requirements and conditions.

Having explained the nature and object of the invention and having illustrated and described a construction embodying the invention in its preferred form, what is claimed is:

1. A transfer ribbon comprising relatively wide strips having inks of different colors, each containing oil and an oil soluble coloring material and a relatively narrow intermediate strip adjoining said first two strips and having an ink containing no oil soluble coloring material.

2. A transfer ribbon comprising a relatively wide strip having ink of a relatively darker color containing a solution of coloring material in oil, a second relatively wide strip having ink of a relatively lighter color, and a relatively narrow intermediate barrier strip adjoining said first two strips and having an ink of substantially the same color as said first ink and containing no oil soluble coloring material.

3. A transfer ribbon comprising a relatively wide longitudinal portion having ink of a relatively light color containing coloring materials and a liquid vehicle in which certain of said coloring materials are soluble, a relatively narrow longitudinal portion adjoining the first portion and having an ink of a relatively darker color comprising coloring materials insoluble in the vehicle of the first ink and a relatively wide longitudinal portion adjoining the second portion and having an ink of substantially the same color as the ink of said second portion and also comprising coloring materials and a liquid vehicle.

4. A transfer ribbon having two relatively wide longitudinal spaced portions inked with inks respectively of relatively light and darker colors each comprising a solution of coloring materials in a liquid vehicle and a relatively narrow intermediate portion adjoining said first two portions and inked with an ink of substantially the same color as the darker ink of one of said first portions and also comprising coloring materials in a liquid vehicle of which the coloring materials are insoluble in the vehicles of the other of said first two inks.

5. A transfer ribbon comprising a relatively wide longitudinal strip having ink of one color containing a solution of coloring material in oil,

a second relatively wide longitudinal strip portion having ink of a different color containing a solution of coloring material in oil, and a relatively narrow intermediate strip adjoining said first two strips and having an ink into which the inks of said first two strips may flow containing no oil soluble coloring material.

6. A transfer ribbon comprising two relatively wide spaced strips impregnated with inks of different colors each containing oil and an oil soluble coloring material and a relatively narrow intermediate strip impregnated with ink into which the inks of the first two strips may flow and said relatively narrow strip of itself containing no coloring material soluble in oil.

7. A transfer ribbon having two relatively wide spaced longitudinal strips inked with inks of different colors each comprising a solution of coloring material in a liquid vehicle and a relatively narrow intermediate strip inked with an ink of substantially the same color as the ink of one of said first portions and comprising coloring material in a liquid vehicle, said coloring material being insoluble in the vehicles of either of said first two inks.

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