

UNITED STATES PATENT OFFICE

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SPIRIT-SOLUBLE COLOR FOR DUPLICATING
INK

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1 Claim. (Cl. 106—22)

1

This invention relates to spirit-soluble dupli-
cating inks for use in transfer processes such
as carbon paper or typewriter ribbon intended
for preparing the master copy in a hectograph
duplicating process.

It is an object of this invention to provide a
black coloring matter of the above type which
shall possess good copying qualities, and be
capable of preparation in economical manner.

A good quality hectograph ink must possess
the following properties:

It must possess the desired color: in this in-
stance, black.

It must have good exhausting qualities, which
means that, say, the 100th or 500th copy taken
off the master copy shall not differ in shade ap-
preciably from the first copy.

It must possess good working qualities, which
means that it should not increase unduly the vis-
cosity of the coating through which the color
is applied to the carbon paper or typewriter rib-
bon.

It must not be too expensive in materials em-
ployed or in the process of preparation.

The above qualifications are particularly dif-
ficult to satisfy in the case of black, inasmuch as
this shade can only be produced by using a mix-
ture of colors, and the components of the mix-
ture do not always exhaust in use at the same
rate, and do not always have the same working
qualities.

In U. S. P. 2,155,862, it has been proposed to
manufacture an ink for the foregoing purpose
by mixing together in the coating vehicle (castor
oil) four color components, namely, crystal vio-
let, brilliant or ethyl green, magenta and chrysoid-
ine.

U. S. P. 2,492,163, attempted to solve the same
problem by reacting together in aqueous solu-
tion chrysoidine, crystal violet and victoria blue,
the quantity of the latter two being stoichiomet-
rically equivalent to the quantity of chrysoidine.

Now I have found that a black coloring matter
of excellent qualities for the purpose hereinabove
set forth may be obtained by melting together
the base form of the following colors in the fol-
lowing proportions, namely—

	Parts
Chrysoidine	100
Crystal violet	66 to 89
Victoria blue	39 to 50

and then adding hydrochloric acid to the melt to
convert the bases into their respective hydrochlo-
rides.

2

My process has the advantage over those of
the prior art in that it involves a very simple
procedure, avoiding filtrations or other time con-
suming operations. Also, it produces an excel-
lent shade of black by using only 3 component
colors, and the color exhausts at a reasonably
uniform rate, avoiding excessive variations in
shade as the hectograph process is continued.

Without limiting this invention, the following
examples are given to illustrate my preferred
mode of operation. Parts mentioned are by
weight.

Example 1

Press cakes containing approximately 25% of
the bases of the following colors and 75% water
were charged into a kettle and heated until a
uniform melt was obtained at about 80° C.

	Parts by weight
Crystal violet (C. I. No. 681)	0.773
Victoria blue (C. I. No. 729)	0.459
Chrysoidine R (C. I. No. 21)	1.000

A 30% hydrochloric acid solution was slowly add-
ed to the melt until a 1 gram sample dissolved in
50 cc. of a 50% solution of ethyl alcohol in water
gave a pH of 2.8. The melt was then cast in pans
and cooled until it solidified. It was then broken
up and dried in a vacuum oven at 50° C.

Incorporation of this product in a standard
mineral oil-carnauba wax vehicle yielded an ink
of excellent properties which when used as a
coating in the preparation of hectograph carbon
paper produced a master copy having a high
copying power and which gave very attractive
black copies of uniform shade.

By contrast, a mechanical mixture of the same
dyes produced a hectograph ink of an objection-
ably high viscosity and which was inferior in heat
stability. The master copy produced from this
ink had inferior copying power and gave copies
which were not uniform in shade.

Example 2

Example 1 was repeated exactly, except using
chrysoidine GN (C. I. No. 20) in place of chrysoid-
ine R. The product when used to prepare a hec-
tograph carbon paper gave a master copy which
produced jet black copies of uniform shade which
were superior to those obtained by mechanically
mixing the same dyes.

When the proportion of crystal violet was var-
ied between 0.66 part and 0.89 part and the pro-
portion of victoria blue was varied between 0.39
part and 0.53 part in either Example 1 or 2, prod-
ucts were obtained which had the same excel-

3

lent properties as those given in these examples but they varied somewhat in shade. In all cases it was found that the pH of the product may be adjusted to between 2.8 and 4.8, by addition of HCl, without materially affecting the qualities of the product.

I claim as my invention:

A spirit-soluble, black color for duplicating inks consisting essentially of an intimate fusion-mixture of the following colors:

	Parts by weight
Chrysoidine	100
Crystal violet	66 to 89
Victoria blue	39 to 53

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4

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
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2,138,836	Brower	Dec. 6, 1938
2,424,954	Neuman	July 29, 1947

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Number	Country	Date
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