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54 Low flammability correction fluid for stencils.

57 A fluid for correction of duplicator stencils comprises a mixed acetate/propionate or acetate/butyrate ester of cellulose, a plasticiser and an extender dissolved in a volatile low-flammability solvent such as a chlorinated hydrocarbon. The correction fluid is safer in transport, storage and use than conventional correction fluids and can be packed in plastics bottles.

LOW FLAMMABILITY CORRECTION FLUID FOR
STENCILS

This invention relates to a fluid for the correction
of errors or faults in stencils that have been 'cut' by
5 typing.

Stencil sheets that can be imaged by typing and that
can be used for stencil duplicating have been used in
offices for many years. They consist of a support or base
sheet of tissue coated with a suitable coating that is
10 impervious to duplicating ink, a paper backing sheet that
acts as a support for the coated tissue as well as
providing the means of mounting the stencil on the
duplicator, and an intermediate waxed sheet to assist
typing quality and often to increase readability of the
15 typed stencil.

If a mistake is made during typing, the present
common practice is for the typist to apply a few drops of
a correction fluid by means of a brush, wait for the fluid
to dry and then re-type over the correction if necessary.
20 It is also possible to use such correction fluid merely to
close areas of stencils already cut and this may even be

done on the stencil duplicator. Such erasures can be done on all kinds of stencils (in addition to typing stencils) that are used on stencil duplicators (e.g. Thermal stencils, hand written stencils and stencils cut by spark
5 erosion).

The above method of stencil correction has the disadvantage that all known type correction fluids contain solvents which are highly inflammable and as such constitute a fire hazard, both in the office and in
10 transportation and in storage of quantities of the fluids. Moreover these correction fluids have to be sold in glass bottles rather than plastic bottles, the latter type being prone to breakage.

Up to now, the problem has been one of finding a
15 suitable film forming resin and extending oils that will not only have the appropriate correction and typing properties, but that will be soluble and compatible with rapid-drying non-flammable solvents. The most satisfactory resin with respect to performance has been
20 nitrocellulose but this material has defied attempts to use it in suitable non flammable solvents whilst retaining good performance. The necessary performance properties of the correction fluid are good flow when applied to the stencil, rapid solvent evaporation to a dried film, good
25 and consistent fill-in of stencillized areas and the ability of the evaporated film to be readily typed giving the same quality of type-work as the original stencil.

We have now found a very small range of resins that can be used in non-flammable solvents and formulated with
30 a mixture of suitable extending oils to give very satisfactory correction fluids. These are mixed acetate/butyrate esters of cellulose and mixed acetate/propionate esters. Only those resins which are known as low viscosity grades are suitable. By low
35 viscosity, we mean less than 2 seconds or 5 poise measured in solution as defined below.

In a second aspect the invention provides a method of

correcting a duplicator stencil which comprises applying to a cut area of a stencil tissue a fluid as defined herein, and allowing the fluid to dry to form a film rendering the cut areas ink-impervious.

5 In a third aspect the invention comprises as a package a plastics bottle containing a correction fluid as defined herein, a removable and reclosable cap for the bottle and an applicator brush for applying the contents of the bottle to stencil tissue.

10 Viscosity of the cellulose esters to be incorporated into the correction fluids is determined by A.S.T.M. method D1343-54T in the solution described as Formula A, A.S.T.M. Method D-87154T. Viscosities in poises are converted to A.S.T.M. seconds equivalent to values
15 obtained under A.S.T.M. Method D-871.48. Resins characterised in this way will give solutions of the appropriate solids content (20%-35%) and flow for use in correction fluids so long as such resins have the correct solubility in non-flammable solvents. Such solubilities
20 are possessed by acetate/butyrate and acetate/propionate esters of cellulose which contain over 35% butyryl or propionyl content and under 15% acetyl content. Examples of such resins are those known as 1/2 second propionate and 1/2 second butyrate. Commercial grades of cellulose
25 acetate butyrate resins are CAB 381-0.5 and CAB 500-1 (Eastman Kodak) and Cellit BP 300 (Bayer). A commercial cellulose acetate propionate grade is CAP-482-0.5 (Eastman Kodak).

Suitable non-flammable solvents are low molecular
30 weight chlorocarbons that evaporate rapidly. These may be used individually or as mixtures. Examples of these are dichloromethane, 1:1-dichloroethane and 1:2-dichloroethylene.

In formulating correction fluids, it may be necessary
35 to add plasticizing materials that will soften the resin as well as extending oils that stretch the resin structure in the film deposited on the stencil so that such a film

is readily typable. Such plasticizers are phthalate and phosphate esters - for example dibutyl phthalate and tricresyl phosphate. Extending oils used are generally mineral oils, for example Carnea 19 or Carnea 46 oil
5 (R.T.M. of Shell), Dutrex 217 (R.T.M. Shell) Flavex 15 (Shell) or Dortan 11 (Esso).

Correction fluids also may contain a dye or pigment either to highlight the correction in which case it will be a colour in contrast to the stencil colour, or to
10 disguise correction in which case it will be the same colour as the stencil. An example of a suitable dye is Rhodamine F.B. (R.T.M. Cheadle Colours). An example of a suitable pigment is Titanox RA61 (R.T.M. Kronos).

The invention is further illustrated in the
15 accompanying Examples:

Example 1

A correction fluid was prepared from the following ingredients (parts by weight):

| | |
|----------------------|------|
| CAB 500-1 | 8.0 |
| 20 Dibutyl Phthalate | 6.0 |
| Rhodamine F.B. | 0.14 |
| Carnea 19 Oil | 7.5 |
| Dichloromethane | 78.4 |

The above materials were mixed together ensuring that the
25 CAB 500-1 resin was completely dissolved in the dichloromethane. The resulting solution was used to correct typing on a stencil by applying with a brush. Its application was smooth and it dried to an even film. On re-typing the corrected portion of the stencil gave a
30 clear image that on duplication was indistinguishable from the rest of the duplicated matter from the same stencil.

Example 2

A correction fluid was prepared from the following
35 ingredients (parts by weight):

| | |
|---------------------|-----|
| CAB 381-0.5 | 8.1 |
| Tricresyl phosphate | 5.6 |

| | |
|--------------------|------|
| Carnea 46 oil | 8.4 |
| Titanox RA 61 | 4.7 |
| Dichloromethane | 50.6 |
| 1:1 Dichloroethane | 22.6 |

- 5 The above ingredients in the proportions shown were weighed into a ball mill and milled over a period of 12 hours. The resulting mixture was then used as a correction fluid as described above.

CLAIMS:

1. A fluid for correction of stencil sheets used in stencil duplicating comprising a solution in a volatile low flammability solvent of (a) a film forming resin which is a mixed acetate/butyrate or acetate/propionate ester of cellulose having a viscosity less than 2 seconds (determined as described above), (b) an extending oil and (c) a plasticiser.
2. A fluid according to Claim 1 wherein at least 35% of the hydroxyl groups of the cellulose ester are esterified with butyryl or propionyl groups and less than 15% of the hydroxyl groups of the cellulose ester are esterified with acetyl groups.
3. A fluid according to Claim 1 or 2, wherein the solvent is a low molecular weight chlorocarbon.
4. A fluid according to Claim 3, wherein the low molecular weight chlorocarbon is dichloromethane, 1,1-dichloroethane or 1,2-dichloroethylene.
5. A fluid according to any preceding claim including as plasticiser dibutyl phthalate or dicresyl phosphate.
6. A fluid according to any preceding Claim including as extender a mineral oil.
7. A fluid according to any preceding Claim further comprising a dye or pigment.
8. A method of correcting a duplicator stencil which comprises applying to a cut area of a stencil tissue a fluid as claimed in any of claims 1 to 7 and allowing the fluid to dry to form a film rendering the cut area ink-impervious.

9. A package comprising a plastics bottle which is reclosable by means of a removeable cap, an applicator brush and in the bottle a fluid as claimed in any of claims 1 to 7.



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EUROPEAN SEARCH REPORT

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EP 81 30 3775

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | CLASSIFICATION OF THE APPLICATION (Int. Cl. ³) |
|---|--|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | |
| | <p>FR - A - 688 425 (KORESKA)</p> <p>* Entire document *</p> <p>--</p> <p>US - A - 2 333 624 (ALTMAN)</p> <p>* Examples; claims**</p> <p>--</p> <p>FR - A - 2 427 369 (KORES)</p> <p>* Page 5, lines 2-4 *</p> <p>----</p> | <p>1,9</p> <p>1</p> <p>9</p> | <p>B 41 C 1/14</p> <p>B 41 N 1/24</p> |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl. ³) |
| | | | <p>B 41 C 1/14</p> <p>B 41 N 1/24</p> <p>C 09 D 9/00</p> |
| | | | CATEGORY OF CITED DOCUMENTS |
| | | | <p>X: particularly relevant</p> <p>A: technological background</p> <p>O: non-written disclosure</p> <p>P: intermediate document</p> <p>T: theory or principle underlying the invention</p> <p>E: conflicting application</p> <p>D: document cited in the application</p> <p>L: citation for other reasons</p> |
| | | | <p>&: member of the same patent family, corresponding document</p> |
| <p><input checked="" type="checkbox"/> The present search report has been drawn up for all claims</p> | | | |
| Place of search The Hague | | Date of completion of the search 26-10-1981 | Examiner AMAND |