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(54) Method for using hard magnetic carriers in an electrographic process

(57) Methods for development of an electrostatic image are disclosed that utilize developer compositions with hard magnetic carrier compositions which can provide improved development efficiencies and reduced amounts of image carrier pick-up. The methods utilize hard magnetic carrier particles that are modified to have specific levels of resistivity, such as, for example, of from about 1×10^5 ohm-cm to about 1×10^{10} ohm-cm, and a

carrier charge-to-mass of greater than about 1.0 $\mu\text{C/g}$, which carriers can provide greater development speeds without unacceptable levels of image carrier pick-up. In embodiments, the hard magnetic materials are doped, i.e., bulk substituted, with multi-valent metals to adjust resistivity, while in other embodiments, the hard magnetic materials are coated with at least one multi-valent metal oxide.

Q/m versus toner concentration

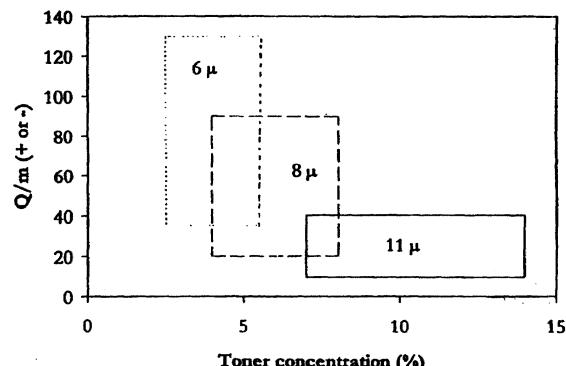


Figure 1



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Application Number
EP 01 11 1258

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



EUROPEAN SEARCH REPORT

Application Number
EP 01 11 1258

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| X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document | | | | | |
| T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | | | |



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-20,63

Method for development of an electrostatic image making use of an electrographic developer composition containing hard magnetic carrier particles with claimed resistivity, and charge to mass ratio

2. Claims: 21-40

Method for development of an electrostatic image making use of an electrographic developer comprising a carrier with hard magnetic material substituted with at least one multivalent metal

3. Claims: 41-60

Method for development of an electrostatic image making use of an electrographic developer comprising carrier which contains a hard magnetic core and an outer surface of metal oxide including a transition zone

4. Claims: 61-62

Method for development of an electrostatic image making use of a carrier with a hard magnetic Sr /Ba /Pb ferrite doped with La.

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