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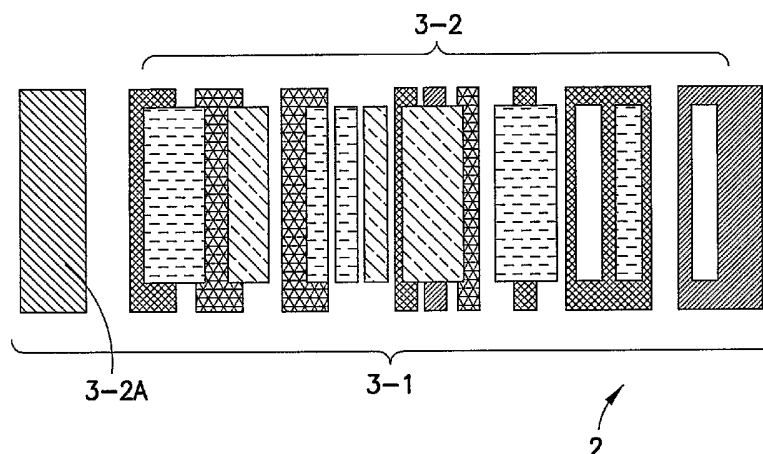
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHODS AND APPARATUS EMPLOYING MULTI-SPECTRAL IMAGING FOR THE REMOTE IDENTIFICATION AND SORTING OF OBJECTS



(57) Abstract: A marking system for use with a multi-spectral imager (10) for use in high, throughput sortation of articles having distorted or irregular surfaces is disclosed. Specific uses include, but are not limited to, document sorting, garment and textile rental operations, laundry operations, and mail and package sorting and identification. Methods and apparatus are provided to remotely identify items via information that is wavelength-encoded within an applied mark, as well as a mark reading/decoding scheme. In the preferred embodiment the marks (2) are multi-dimensional. In one preferred embodiment the marks are used to realize multi-dimensional wavelength-enabled coding schemes. The marks (2) can be overlaid one upon another and/or they can contain one or more key regions having at least one predetermined spectral characteristic for providing information related at least to reading and/or decoding the marks.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/27840

A. CLASSIFICATION OF SUBJECT MATTER

IPC: B07C 5/00(2006.01);G06K 7/10(2006.01)

USPC: 209/3.3,578;235/491

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 209/3.3, 578;235/491;209/3,546,547,576,577,580-
584;250/559.01;382/111,112;356/51,71;235/435,460,461,462.04,469

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST 1.4.1 - USPAT, USPGPUB, JPO, EPO, DERWENT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,119,943 A (Christy) 19 September 2000 (19.09.2000), column 4, lines 13-30.	1 and 46

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

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Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US03/27840

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

Claims 1-31 and 46-52, drawn to a method for encoding information onto an article and a marking for an article containing encoded information, classified in class 235, subclass 491.

Claims 32-44, 53 and 54, drawn to a method for decoding information encoded onto an article system for decoding information encoded onto an article, classified in class 209, subclass 581.

Claims 45 and 55, drawn to a method for sorting articles and a system for sorting articles, classified in class 209, subclass 576.