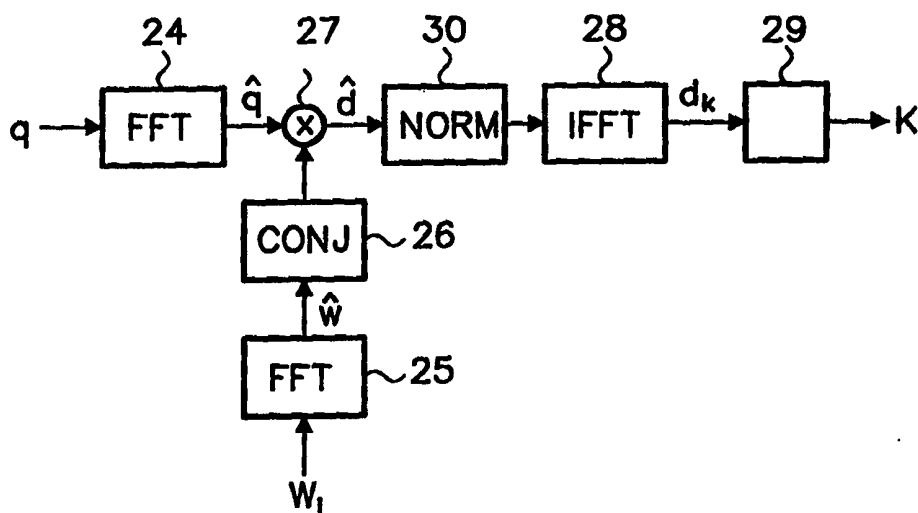




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(51) International Patent Classification <sup>6</sup> :</b><br><br><b>H04N 5/913, 1/32</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>A3</b> | <b>(11) International Publication Number:</b> <b>WO 99/45707</b><br><br><b>(43) International Publication Date:</b> 10 September 1999 (10.09.99)                                                                                                                                                                                                                                                                                                                          |
| <b>(21) International Application Number:</b> PCT/IB99/00359<br><br><b>(22) International Filing Date:</b> 2 March 1999 (02.03.99)<br><br><b>(30) Priority Data:</b><br>98200656.1                      4 March 1998 (04.03.98)                      EP<br><br><b>(71) Applicant (for all designated States except US):</b> KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).<br><br><b>(71) Applicant (for SE only):</b> PHILIPS AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE).<br><br><b>(72) Inventors; and</b><br><b>(75) Inventors/Applicants (for US only):</b> HAITSMA, Jaap, A. [NL/NL]; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). KALKER, Antonius, A., C., M. [NL/NL]; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). DENISSEN, Adrianus, J., M. [NL/NL]; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).<br><br><b>(74) Agent:</b> SCHMITZ, Herman, J., R.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). |           | <b>(81) Designated States:</b> CN, IN, JP, KR, RU, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).<br><br><b>Published</b><br><i>With international search report.</i><br><i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i><br><br><b>(88) Date of publication of the international search report:</b><br>25 November 1999 (25.11.99) |

(54) Title: WATERMARK DETECTION



## (57) Abstract

An improved method and arrangement for detecting a watermark in an information (e.g. image or video) signal are disclosed. The detection is more reliable and less vulnerable to image processing by subjecting the suspect image (q) and the watermark to be detected (w) to Symmetrical Phase Only Matched Filtering (24-28, 16) prior to detecting (29) the amount of correlation (d) between said signals.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 99/00359

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04N 5/913, H04N 1/32

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)

IPC6: H04N

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

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                             | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| P,A       | Kalker, Ton et al, "Video watermarking system for broadcast monitoring", 1999, ., (San Jose, CA, USA), see chapter 2,4,5<br>--                                 | 1-8                   |
| P,A       | WO 9854897 A2 (KONINKLIJKE PHILIPS ELECTRONICS N.V.), 3 December 1998 (03.12.98), page 3, line 25 - page 4, line 7, abstract<br>--                             | 1-8                   |
| E,A       | Maes, M. et al, "Exploiting shift invariance to obtain a high payload in digital image watermarking", 1999, ., (Florence, Italy), see chapter 3<br>--<br>----- | 1-8                   |

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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### Information on patent family members

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International application No.

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| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---------------------|----------------------------|---------------------|
| WO 9854897 A2                             | 03/12/98            | EP 0920775 A               | 09/06/99            |
| -----                                     |                     |                            |                     |