

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
H04N 7/24

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(43)

10-2004-0058311
2004 07 03

(21)
(22)

10-2004-7007804
2004 05 21
2004 05 21

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(86)

PCT/IB2002/004485
2002 10 24

(87)
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wo 2003/044735
2003 05 30

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2001 11 23

EP(EP)

(71)

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,

1

(72)

,

,

5656,

6

(74)

(54)

.

, DVD

(3)

(JND)

(1)

(3)

(33)

(36)

MPEG

1

,

(remote location)

(local station)

(arrangement)

.

,

(watermark embedders) (, , ,)
(strength) , (details),
(contents) 가 가
, , 가
가 .
가 (embedder)
가
가
가
가 (' 1 ') 가 1
가 (2 ' ,) ,
1
1
2a 2c 1
(1), (2) (3) 1

(1) (11) MPEG (12) (11) 가 가 .
 , 1 , WO99/45705 , .
 1 , 가 .
 MPEG (12) MPEG (2) (3)
 (3) (compliant) DVD 가 ' 1 가
 , DVD () , DVD
 , 가 ' (2 (remar
 king)') ,
 2a DVD , MPEG (12) ,
 8×8 가 2A 201 .
 8×8 DCT (DCT) .
 (average luminance) DC
 AC AC (coarse details)
 , (fine details) .
 DVD (3) Frank Hartung Bernd Girod 'Digital Watermarking of MPEG-2 Coded Video in the
 Bitstream Domain'(ICASSP Vol.4, 1997, pp.2621 - 2624) DCT MP
 EG (remark) , (32;partial decoding circuit) (u,v)
 DCT 가 MPEG . DCT (33) ,
 DCT 1 X(u,v) (321;spath) ,
 가 (pseudo-random noise sequence) .
 , 128×128 (basic watermark pattern) (tiled)' W
 2B . 128×128 -
 , 128×128 MPEG W 8×8 , 2B 202
 가 , DCT 128×128 (36) 1 1
 W(u,v) .
 W DCT DCT DCT ,
 2B (202) DCT 가 2A (201) DCT (artifacts)
 . C. Podilchuk W. Zeng 'Perceptual Watermarking of Still Images'(IEEE Signal Processing Society
 1997 Workshop on Multimedia Signal Processing, Princeton, New Jersey, USA, June23-25, 1997, pp.363-36
 8)
 (visual models)
 , (JND;just noticeable dif
 ferences) (Watson) (' ') An
 drew B. Watson 'DCT Quantization Matrices Visually Optimized for Individual Images'(SPIE Vol. 1913, 199
 2, pp.202-216) .

(3) (33) , Podilchuk Zeng 가 , DVD
 DCT

$$X'(u,v) = \begin{cases} X(u,v) + JND(u,v) \cdot W(u,v) & \text{if } X(u,v) > JND(u,v) \\ X(u,v) & \text{그렇지 않으면} \end{cases}$$

, JND(u,v) DCT .

DCT (34) 가 MPEG
(35) 2C (202) (2
(203) (204)
05)
(JND(u,v)) (13)
(3) JND (3) 1
(14) JND MPEG2 가
MPEG JND DCT (fragile) (payload) JND
3 018 UK GB 2 06
(3) JND (31)
(3) JND 가 가 가
(JND)
WO99/45705 (visibility mask)
가 가
가
(1) (36) (13) DVD (3)
(3) (JND) (33)
MPEG

(57)

1.

2.

3.

(fragile watermark)

4.

가

가

5.

6.

가

7.

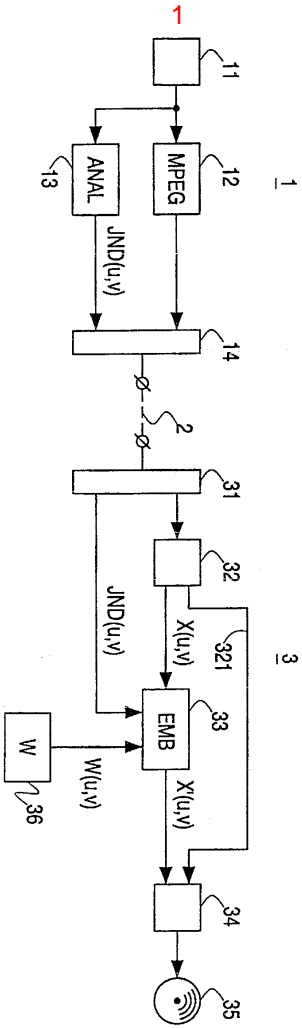
가

8.

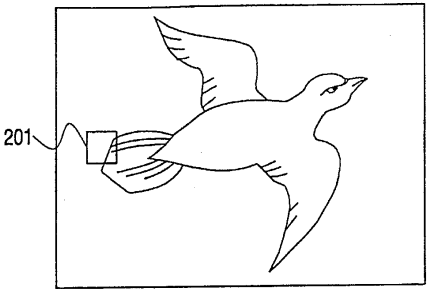
가

가

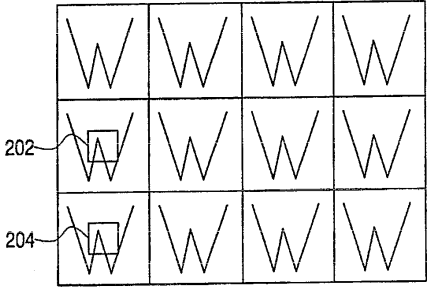
9.



2a



2b



2c

