Figure. 1 (*prior Art*)
Typical Round-Trip E-Mail Flow
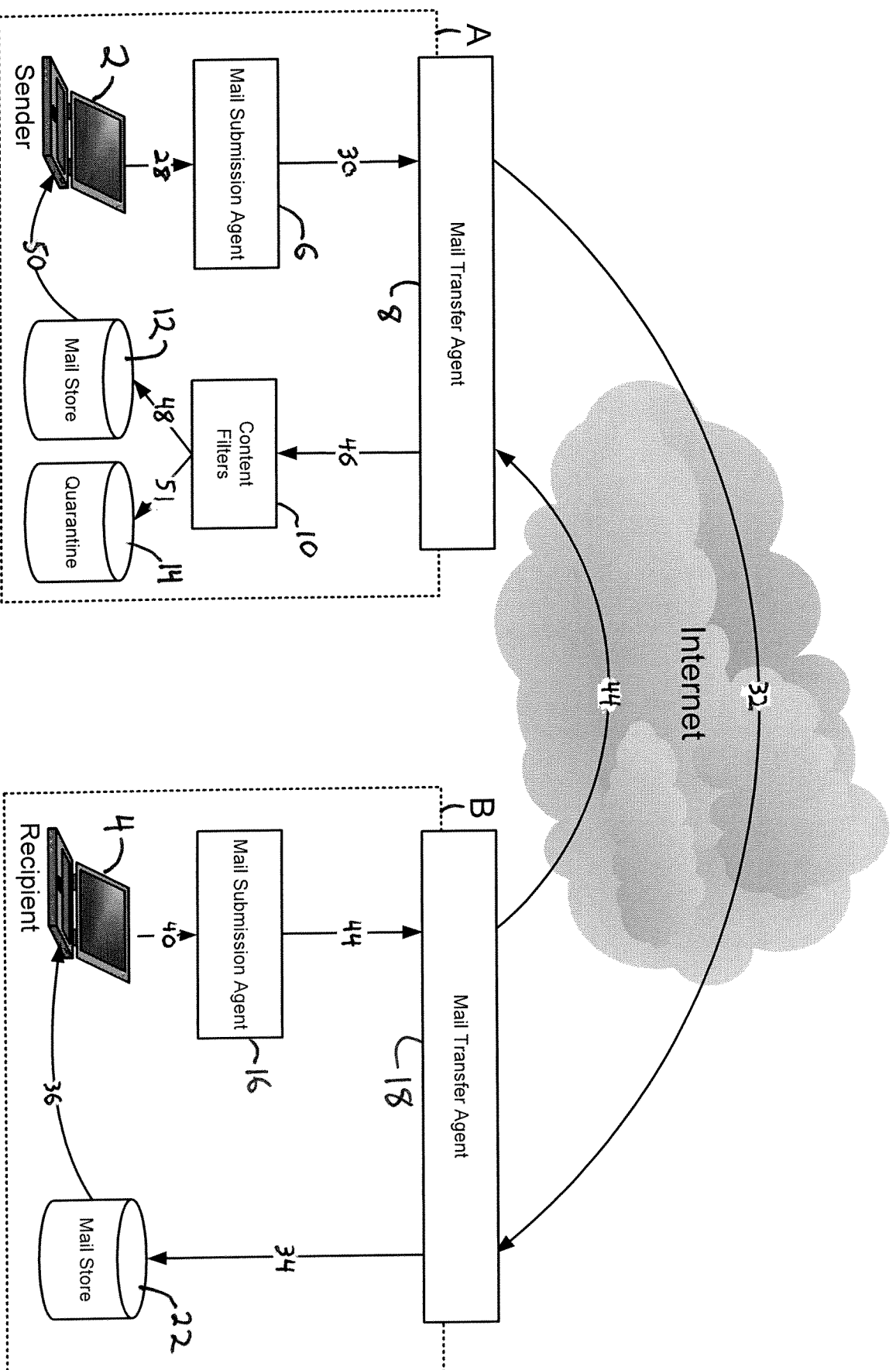
Figure. 2
Round Trip E-Mail Flow with EMEW
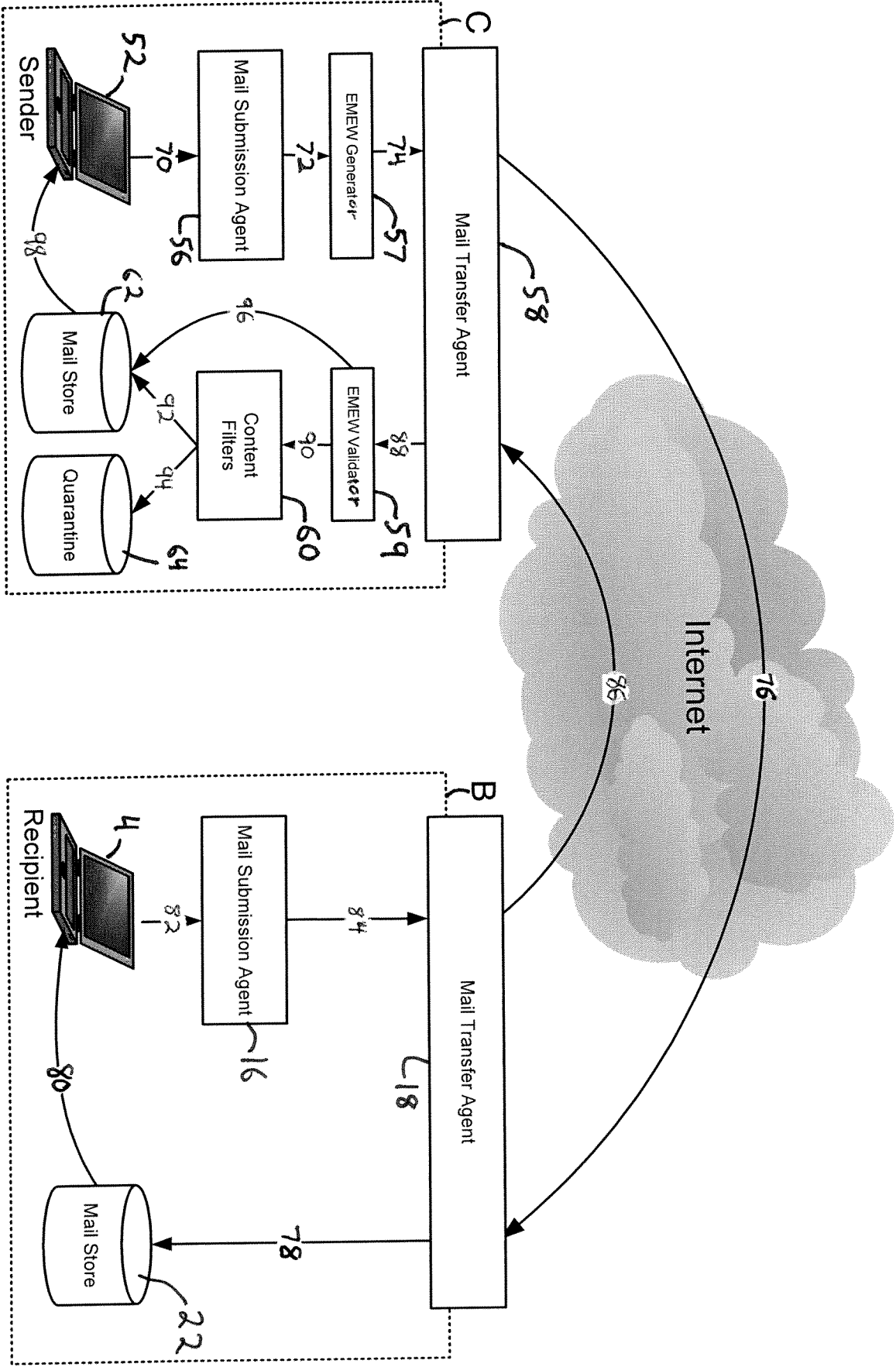
Figure 3
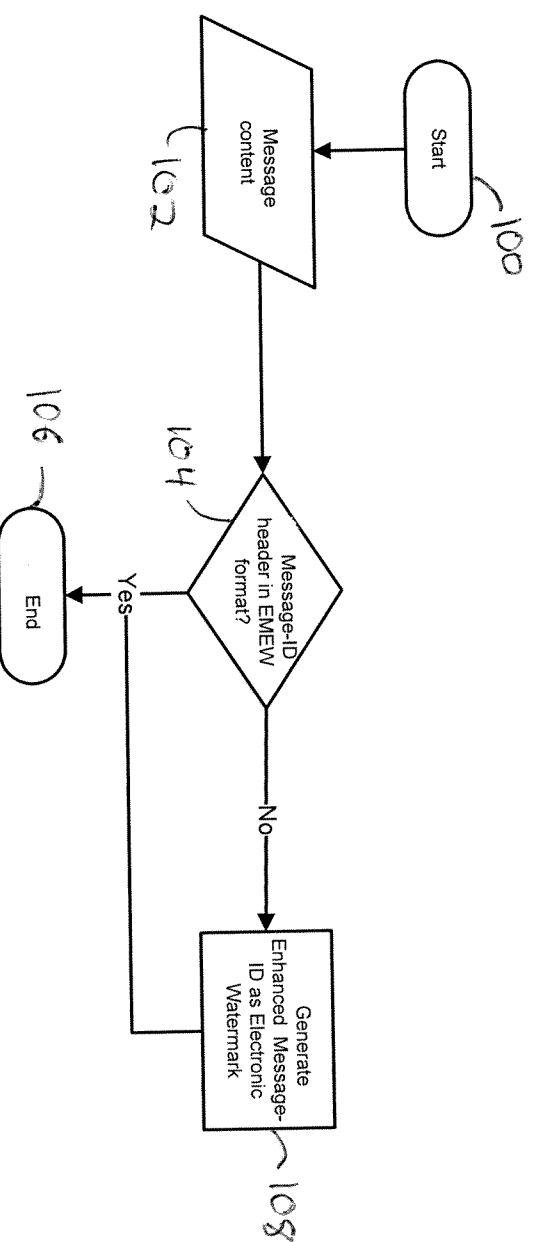## EMEW Generation

Start — 100

Message content — 102

Message-ID header in EMEW format? — 104

No →

Generate Enhanced Message-ID as Electronic Watermark — 108

Yes → End — 106

Figure 4
EMEW Validation

```
      ┌─────────┐              ╱────────────────╲
      │  Start  │─────────────▶  Message content for
      └─────────┘              ╲  validation     ╱
        200                         202
```

Start → 200

Message content for validation → 202

Mail From: null sender? → 204

Has original Mesage-ID header in report → 206

←Yes← (from 204 to 206)

Get original Message-ID from report → 208

Was Message-ID generated here? → 210

Has this EMEW expired? → 212

Has References header? → 216

Has In-Reply-To header? → 218

Header has more EMEW? → 222

Get next EMEW in header → 224

Has this EMEW expired? → 226

Was this EMEW generated here? → 228

Reject or Discard message → 207

By-pass content filters → 214

Proceed with content filtering → 220

End → 215

Arrows/labels:
- 204 No → 216
- 216 No → 218
- 218 Yes → 222
- 222 Yes → 224
- 222 No → (down to 228 No path / 220)
- 224 → 226
- 226 Yes → 222 (up)
- 226 No → 228
- 228 Yes → 214
- 228 No → 220
- 206 No → 207
- 206 Yes → 208
- 210 No → 207
- 210 Yes → 212
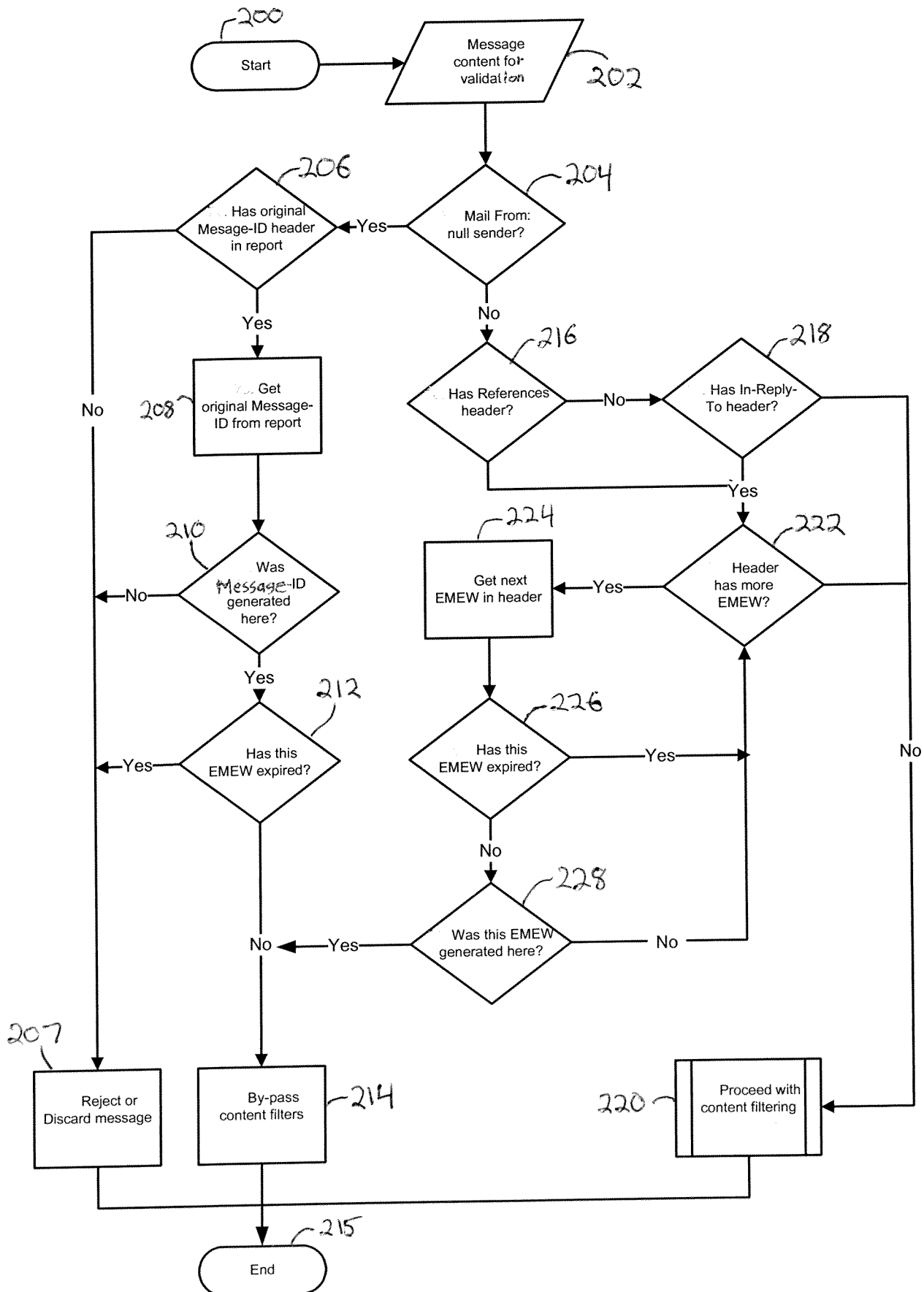- 212 Yes → 207
- 212 No → 214
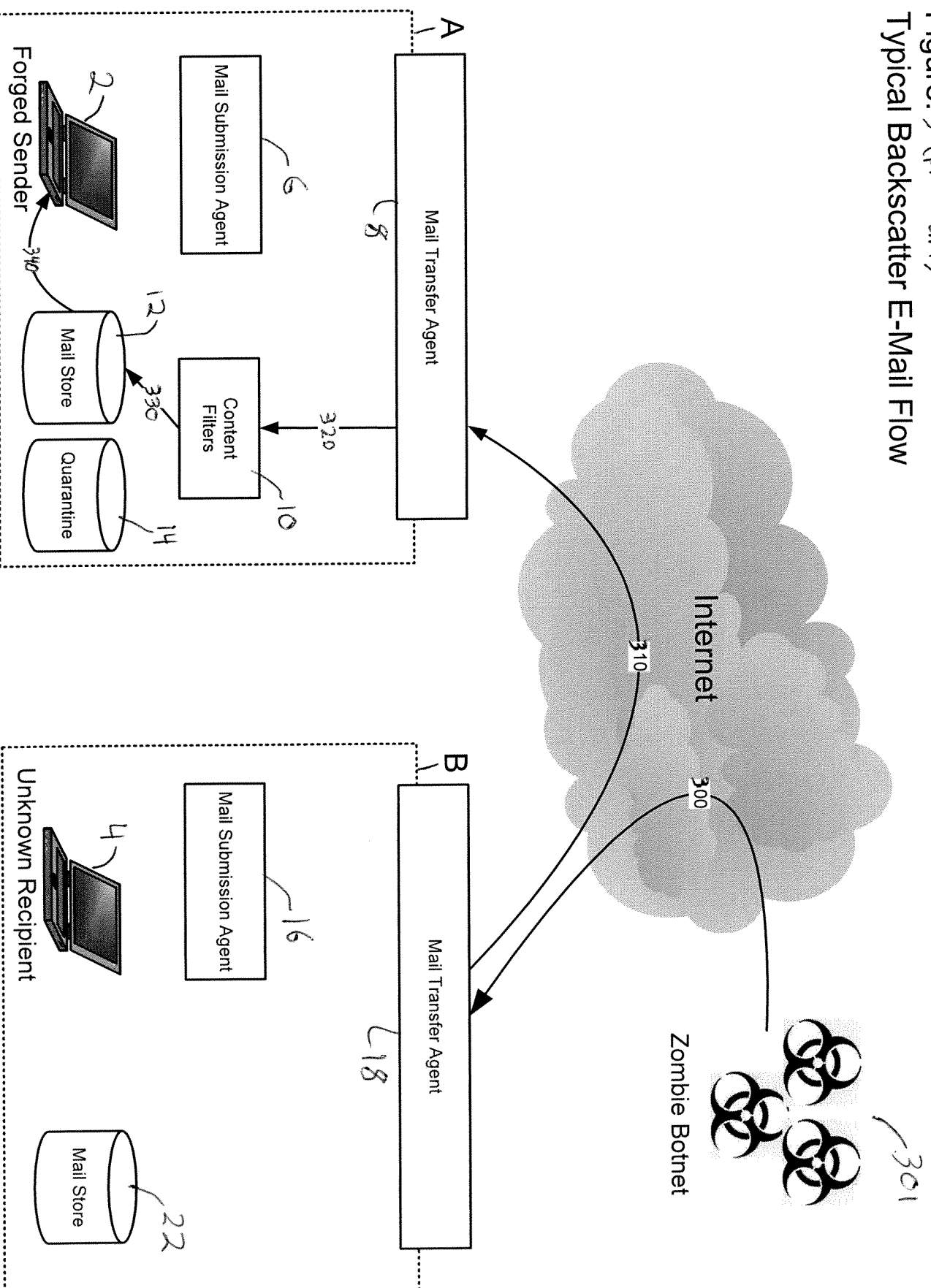- 218 No → 220

Figure. 5 (prior art)
Typical Backscatter E-Mail Flow

Figure.6
Backscatter E-Mail Flow with EMEW

Forged Sender

52

Mail Submission Agent
56

EMEW Generator
57

Mail Transfer Agent
58

EMEW Validator
59

Content Filters
60

DSN or MDN Discarded
430

420

Mail Store
62

Quarantine
64

C

Internet

410

400

Zombie Botnet
401

Unknown Recipient

4

Mail Submission Agent
16

Mail Transfer Agent
18

Mail Store
22

B