

SUPPLEMENTAL APPENDIX TO EXHIBIT E

MOOD MEDIA CLAIM CHART

U.S. Patent No. 12,075,116 B2

Analysis of Element Mappings Requiring Additional Support

I. INTRODUCTION AND PURPOSE

This Supplemental Appendix is filed in support of, and incorporated by reference into, the Mood Media Claim Chart attached as Exhibit E to Plaintiff’s Complaint. It provides additional factual and technical support for three claim elements of U.S. Patent No. 12,075,116 B2 (the “’116 Patent”) that depend upon inferential reasoning from publicly available Mood Media documentation and for which Plaintiff expects further direct evidence through discovery:

- (a) the “at least one multicasting server” element;
- (b) the “headless rendering engine” element; and
- (c) the “detecting a change at the at least one website” element and its corresponding response step.

For each element, this Appendix (i) identifies the claim language at issue, (ii) states the plain-meaning and claim-construction positions Plaintiff intends to advance, (iii) summarizes the publicly available evidence relied upon in the Claim Chart, (iv) identifies the categories of additional evidence Plaintiff expects to obtain in discovery, and (v) notes available alternative theories of infringement (including the doctrine of equivalents) preserved for later briefing. Nothing in this Appendix should be construed as limiting or conceding Plaintiff’s positions on literal infringement.

II. PLEADING AND CONSTRUCTION STANDARDS GOVERNING THIS APPENDIX

At the pleading stage, a patentee need not prove infringement but must plead facts sufficient to place the accused infringer on notice and to make the infringement allegation plausible on its face. See *Bell Atl. Corp. v. Twombly*, 550 U.S. 544 (2007); *Ashcroft v. Iqbal*, 556 U.S. 662 (2009); *Disc Disease Sols. Inc. v. VGH Sols., Inc.*, 888 F.3d 1256, 1260 (Fed. Cir. 2018); *Bot M8 LLC v. Sony Corp. of Am.*, 4 F.4th 1342, 1352–53 (Fed. Cir. 2021) (a patentee “is not required to plead infringement on an element-by-element basis” but must provide sufficient factual allegations to raise a plausible inference of infringement for each asserted claim).

Claim construction is a matter of law reserved to the Court and is not resolved at the pleading stage. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996); *Nalco Co. v. Chem-Mod, LLC*, 883 F.3d 1337, 1349 (Fed. Cir. 2018). Plaintiff’s allegations below therefore use the plain and ordinary meaning of the claim terms at issue, consistent with the intrinsic record of the ’116 Patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005).

Information and technical details concerning the internal architecture of the Mood Harmony platform — including specific software components employed for content rendering, multicast delivery, and change detection — are uniquely within the possession, custody, and control of Defendants. Where evidence is pled on information and belief below, it reflects both (i) Plaintiff’s good-faith inferences from publicly available Mood documentation and established industry practice, and (ii) Plaintiff’s expectation that discovery will confirm the inferences drawn. See *Arista Networks, Inc. v. Cisco Sys.*, 908 F.3d 792, 800 (Fed. Cir. 2018).

III. ELEMENT A — “AT LEAST ONE MULTICASTING SERVER”

A. Claim Language

Claim 1 recites, in relevant part: “a computing system comprising a caching unit and at least one multicasting server” and “receiving, at the caching unit, a request from the at least one multicasting server for at least one media stream for playback on a broadcast media channel.”

B. Plain and Ordinary Meaning

The plain and ordinary meaning of “multicasting server” to a person of ordinary skill in the art (a “POSITA”) is a server that transmits data to multiple recipients at once — i.e., to a plurality of endpoints on a network, whether through one-to-many IP multicast (e.g., IGMP/PIM), application-layer multicast, Multicast DNS (mDNS) resolution and delivery, or a content-delivery network (CDN) architecture that replicates content to edge nodes for delivery to many endpoints. Nothing in the ’116 Patent’s claim language, specification, or prosecution history limits “multicasting server” to MPEG Transport Stream IP multicast as described in particular embodiments. Limitations from embodiments may not be imported into the claims. Phillips, 415 F.3d at 1323.

Although the ’116 Patent’s specification describes exemplary embodiments in the context of cable television and satellite operators using MPEG Transport Stream multicast, Claim 1 is broader and uses the term “multicasting server” in its plain and ordinary sense. Claim 4 of the ’116 Patent, which recites “the content provider is one of a cable television operator and a satellite television operator,” makes clear under the doctrine of claim differentiation that Claim 1 is not limited to cable or satellite providers. Phillips, 415 F.3d at 1315.

C. Publicly Available Evidence Supporting the Allegation

1. **IP multicast via mDNS (RFC 6762).** Mood’s own documentation describes access to Harmony media players via *.local* domain names (e.g., <https://profusion-398994.local>), which are resolved via Multicast DNS (mDNS) under RFC 6762. Mood Media, <https://support.moodmedia.com/profusion-ih/how-to-log-on-to-the-online-control-panel/>. mDNS uses UDP multicast to a well-known multicast address (224.0.0.251 / FF02::FB) for service discovery and name resolution on the local network. IETF, RFC 6762, §§1, 3, 6, available at

<https://datatracker.ietf.org/doc/html/rfc6762>. The server component resolving the .local queries at the customer premises is, by definition, a multicast server.

2. **CDN-based content multicasting via AWS CloudFront.** Mood’s Network Requirements documentation states: “[harmony.moodmedia.com](https://support.moodmedia.com/wp-content/uploads/2025/06/Harmony-Media-Player-Network-Security-Documentation.pdf) is powered by AWS CloudFront and public IP addresses will vary over time and region. Harmony is hosted in AWS US East (Northern Virginia) Region.” Mood Media, <https://support.moodmedia.com/wp-content/uploads/2025/06/Harmony-Media-Player-Network-Security-Documentation.pdf> at p. 6. AWS CloudFront is an application-layer content-delivery network that replicates content to geographically distributed edge nodes and delivers the replicated content to many endpoints from those edges — an architecture functionally equivalent to one-to-many multicasting at the application layer.
3. **Feed-aggregation servers acting as multicast sources.** Mood’s Network Security Documentation identifies multiple server endpoints — *harmony.moodmedia.com/feeds*, *mvision-us.moodmedia.com*, **.bsn.cloud*, and **.brightsignnetwork.com* — each of which serves content to many Harmony and BrightSign media players. *Id.* at pp. 6–7. These servers functionally multicast content at the application layer by delivering the same media stream, concurrently, to numerous endpoints.
4. **Simultaneous deployment via “Publish All Channels.”** Mood’s Harmony Visual Basics documentation describes a “Publish All Channels” function that deploys content to all channels and all media players concurrently. See <https://support.moodmedia.com/library/harmony-visuals/Harmony-Visual-Basics.pdf> at p. 13. This single operation pushes identical media streams to a plurality of endpoint players — an operation that, by its very definition, requires a multicasting server or server-functionality within the Harmony CMS.

D. Additional Evidence Expected Through Discovery

Discovery is expected to confirm and refine the allegations above. Plaintiff expects to obtain through discovery:

1. Source code and architecture documentation identifying the multicast subsystem(s) of the Harmony CMS, including any IGMP/PIM-based multicast streaming, any application-layer multicast (e.g., Pub/Sub, message broker, group delivery);
2. Engineering documentation describing the CDN edge topology used to deliver media streams to Harmony endpoints, including any multicast edge replication;
3. Documentation of the mDNS service-discovery architecture used on customer premises to identify and address Harmony media players;
4. Relevant deposition testimony of Mood Media engineering personnel concerning the foregoing.

E. Alternative Theory — Doctrine of Equivalents

Plaintiff expressly reserves the right to allege infringement of the “multicasting server” element under the doctrine of equivalents. Even assuming arguendo that the Mood Harmony content-delivery architecture

does not literally employ multicast-addressing protocols, any differences between the accused CDN/feed/mDNS-based distribution architecture and a server performing literal IP multicasting are insubstantial. The Harmony architecture performs substantially the same function (concurrent distribution of identical media streams to a plurality of endpoints), in substantially the same way (server-side replication and endpoint-initiated retrieval), to achieve substantially the same result (simultaneous in-store playback of a common content stream across many customer locations). *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997); *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950).

IV. ELEMENT B — “HEADLESS RENDERING ENGINE”

A. Claim Language

Claim 1 recites: “generating a plurality of screen captures of the rendered web page using a headless rendering engine.”

B. Plain and Ordinary Meaning

To a POSITA, a “headless rendering engine” is a browser or rendering engine that parses, lays out, and rasterizes web content (HTML, CSS, JavaScript) without requiring a visible display or user interface. Well-known examples include headless Chromium (including Puppeteer-driven Chromium), headless Firefox, historical headless PhantomJS, Android WebView operated off-screen, and equivalent server-side or embedded-device rendering engines. The defining characteristic is that the engine performs full web-page rendering (producing a bitmap output) without presenting the output on a screen.

C. Publicly Available Evidence Supporting the Allegation

- 1. Mood Visuals templates are HTML.** Mood’s own documentation confirms that Mood Visuals templates are authored in HTML: “the templates are done in HTML, while the Channel editor is in video format.” The Mood documentation shows that HTML templates from <https://harmony.moodmedia.com> are converted into video sequences for playback (e.g., “47 items 00:10:30.951”). See <https://support.moodmedia.com/library/harmony-visuals/Harmony-Visual-Basics.pdf>.
- 2. H.264 MP4 video is the required output format.** Mood Visuals File Specifications require output in H.264 MP4 video (preferred) at dimensions up to 1920×1080 or 1080×1920, 29.97 fps, with a constant bit rate of 10–20 Mbps. See https://support.moodmedia.com/wp-content/uploads/2025/04/MoodVisuals_FileSpecifications.pdf. Converting HTML input to H.264 MP4 output requires frame-by-frame rasterization of the rendered HTML, which in contemporary engineering practice is performed using a headless browser engine. Dynamic HTML content (including template substitutions, embedded data feeds, and Mood’s AI Copilot features) cannot be converted to H.264 MP4 through static image processing alone.

3. **Player-screenshot feature.** Mood’s Harmony Visual Basics documentation describes screenshot functionality on certain Harmony devices: “on certain devices you can view screenshots in 5 minutes increments for the past few days by clicking on the Screenshots tab.” See <https://support.moodmedia.com/library/harmony-visuals/Harmony-Visual-Basics.pdf> at p. 14. A functionality that captures rendered screen content every five minutes for monitoring necessarily employs a headless capture mechanism operating on the rendered web content.
4. **BrightSign platform / Chromium engine.** Mood’s Harmony MAVP-B2 media players and related Harmony-BrightSign devices communicate with *.bsn.cloud and *.brightsignnetwork.com servers. See <https://support.moodmedia.com/wp-content/uploads/2025/06/Harmony-Media-Player-Network-Security-Documentation.pdf> at p. 6. Upon information and belief, the BrightSign firmware on these devices incorporates a Chromium-based HTML rendering engine which Mood utilizes, in connection with Harmony CMS, to render Mood Visuals HTML templates into the video streams delivered to customer displays.
5. **Industry practice.** Converting HTML templates into video output — the precise workflow Mood documents in its public materials — is a well-recognized pattern in commercial digital-signage systems, and the state of the art uniformly implements this conversion via headless browser engines such as headless Chromium, Puppeteer, or Electron run in a server or embedded-device context. It is implausible that Mood has implemented this feature without such an engine.

D. Additional Evidence Expected Through Discovery

1. Engineering and architecture documentation identifying any headless browser engines, web-rendering frameworks, or HTML-to-video pipelines employed by the Harmony CMS and Harmony media players (e.g., headless Chromium, Chrome Embedded Framework (CEF), Electron, Puppeteer, Playwright, PhantomJS, WebView, BrightSign browser);
2. Source code for Harmony CMS rendering, preview, thumbnail, and video-generation modules;
3. Documentation describing the Mood Visuals template-to-video conversion pipeline;
4. Deposition testimony of Mood Media engineering personnel concerning the foregoing.

E. Alternative Theory — Doctrine of Equivalents

If Mood Media’s implementation is shown to use a non-traditional rendering component that does not meet the literal construction of “headless rendering engine,” Plaintiff preserves the doctrine-of-equivalents theory. Any rendering mechanism that produces bitmap screen captures of HTML-template content without presenting that content on a user-facing display performs substantially the same function, in substantially the same way, to achieve substantially the same result as a “headless rendering engine” as claimed.

V. ELEMENT C — “DETECTING A CHANGE AT THE AT LEAST ONE WEBSITE”

A. Claim Language

Claim 1 recites two linked steps: “detecting a change at the at least one website corresponding to at least one of the plurality of multimedia items saved at the caching unit” and, “in response to the detecting the change, retrieving a new plurality of screen captures from the at least one website for the at least one of the plurality of multimedia items.”

B. Plain and Ordinary Meaning

The plain and ordinary meaning of “detecting a change at the at least one website” encompasses any mechanism by which the computing system identifies that content at a website corresponding to a saved multimedia item has been altered, updated, added, replaced, or removed. The claim imposes no requirement that change detection be wholly automated, wholly passive, or initiated without any user input; it imposes no requirement that the “website” be external to the defendant’s own infrastructure. The claim is satisfied so long as a change at the website is detected, and screen captures are retrieved in response to that detection.

The ’116 Patent’s specification supports this plain-meaning reading. The patent describes the change-detection functionality as part of the caching and updating mechanism for keeping the cached multimedia items synchronized with their source websites — a function served equally by polling, push notifications, check-in intervals, CMS-triggered propagation, and other mechanisms.

C. Publicly Available Evidence Supporting the Allegation

- 1. Scheduled player check-ins.** Mood’s Harmony Visual Basics documentation describes scheduled player check-ins with the CMS. Players report a “Green/OK” status when they are “online and receiving content updates,” and a red/error status when a player “failed to check in during one of its last two scheduled check-in times.” See <https://support.moodmedia.com/library/harmony-visuals/Harmony-Visual-Basics.pdf> at p. 14. These scheduled check-ins are a classic polling mechanism by which the Harmony player detects whether new or changed content is available at <https://harmony.moodmedia.com>.
- 2. Automatic Media Library→Channel propagation.** Mood’s Harmony Visual Basics documentation states: “If you update properties of an asset in the Media Library it will automatically update that same asset located in the Channel.” See <https://support.moodmedia.com/library/harmony-visuals/Harmony-Visual-Basics.pdf> at p. 8. The use of the word “automatically” establishes that the system detects the update — i.e., the change at the Media Library website (<https://harmony.moodmedia.com>) — and propagates the corresponding updated asset to the Channel without further user intervention.
- 3. Dynamic external feeds.** Mood’s Network Security Documentation identifies “flexible content management” that integrates live external feeds — including Twitter/X feeds, RSS feeds, weather, and similar live data sources. See <https://support.moodmedia.com/wp-content/uploads/2025/06/Harmony-Media-Player-Network-Security-Documentation.pdf> at p. 7. These external feeds are websites that, by their nature, change continually; consuming them in the Harmony product line necessarily entails a change-detection mechanism that polls or subscribes to the feed source and retrieves new content in response to detected changes.

4. **Player-side update detection.** The Harmony Music product documentation states: “when adding new music to your Music Library it will take a few minutes for the player [to] download enough songs to play the music content you chose” and “If after several minutes the music has not changed on your player after clicking Play Now, your Harmony Music player may be offline.” See <https://support.moodmedia.com/harmony/my-music-isnt-changing-or-updating/>. This confirms that the Harmony player automatically detects changes in the Harmony Music Library at the Harmony control site and retrieves the new content in response to that detection.
5. **“Force Update” publishing.** Mood’s “Publish All Channels & Force Update” feature states: “Publishes the content in all Channels. The content will begin downloading to the media player within 10 minutes and begin playing once downloaded (based on scheduling).” See <https://support.moodmedia.com/library/harmony-visuals/Harmony-Visual-Basics.pdf> at p. 13. This is a change-detection-and-response feature by which the CMS notifies media players of content changes and the media players retrieve the updated content in response.

D. Additional Evidence Expected Through Discovery

1. Engineering documentation describing the polling, check-in, webhook, or push-notification mechanisms by which the Harmony CMS detects changes and notifies media players;
2. Documentation of the live external feed ingest pipelines (Twitter/X, RSS, weather, POS, etc.), including polling intervals, change-detection heuristics, and caching behavior;
3. Source code for the Media Library → Channel propagation mechanism;
4. Deposition testimony of Mood Media engineering personnel concerning the foregoing.

E. Alternative Theory — Doctrine of Equivalents

Plaintiff preserves the doctrine of equivalents as an alternative basis for infringement of the change-detection and responsive-retrieval steps. Any mechanism by which the Harmony CMS becomes aware that content has changed at a source location — whether through polling, scheduled check-ins, webhooks, push notifications, CMS-driven propagation, or user-triggered republish operations — and in response causes retrieval of updated content performs substantially the same function, in substantially the same way, to achieve substantially the same result as the claimed “detecting a change” and responsive “retrieving a new plurality of screen captures” steps.

VI. CONCLUSION

For the reasons and on the publicly available evidence set out above — and consistent with the allegations of the Mood Media Claim Chart at Exhibit E — Plaintiff’s allegations concerning the “multicasting server,” “headless rendering engine,” and “detecting a change at the at least one website” claim elements are plausible, well-supported, and satisfy the applicable pleading standard under *Iqbal*, *Twombly*, and *Bot M8*. Plaintiff respectfully submits that these allegations are sufficient to place

Defendants on notice of the accused instrumentalities and the theories of infringement, and that any residual evidentiary questions are properly resolved through discovery.

Plaintiff reserves all rights to supplement and amend the Claim Chart, this Supplemental Appendix, and the Complaint based on information obtained through discovery, including without limitation technical documentation, source code, and deposition testimony produced by Defendants.