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11

12   UNITED STATES DISTRICT COURT

13   NORTHERN DISTRICT OF CALIFORNIA

14   SAN FRANCISCO DIVISION

15 REARDEN LLC, REARDEN MOVA LLC,   No.
   California limited liability companies,
16
                                Plaintiffs, **COMPLAINT FOR COPYRIGHT
17   AND TRADEMARK
              v.   INFRINGEMENT**
18
   PARAMOUNT PICTURES CORPORATION,
19 a Delaware corporation, PARAMOUNT HOME   **DEMAND FOR JURY TRIAL**
   ENTERTAINMENT DISTRIBUTION INC., a
20 Delaware corporation,

21   Defendants.

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Plaintiffs Rearden LLC and Rearden Mova LLC (collectively, "Plaintiffs"), through their attorneys and for their claims against defendant Paramount Pictures ("Paramount"), allege as follows.

I.   INTRODUCTION

1.   Paramount's *Terminator: Genisys* opened in the United States on July 1, 2015, grossing $89 million domestically and $441 million worldwide throughout its theatrical release[1], the second-highest worldwide gross in the 31-year Terminator movie franchise.[2] Before, during, and after the theatrical release, Paramount repeatedly promoted the film with trailers[3] and social media postings of what Paramount called "A battle for the ages...Arnold vs. Arnold…[4]", an epic fight between a current-age (67) Arnold Schwarzenegger Terminator character and a 1984-age (37) Arnold Schwarzenegger Terminator character from the original *The Terminator (1984)* movie, created entirely with a CG (computer graphics) face.

2.   Mr. Schwarzenegger's face and expressions at age 37 are so famously known and recognizable, there was no margin for error: the CG face had to look and move exactly as it did at age 37. Paramount turned to an innovative, soon-to-be Oscar-winning, Visual Effects ("VFX") technology called MOVA Contour Reality Capture, which carried every human subtlety of age-67 Mr. Schwarzenegger's facial performance through to the face of the age-37 CG character. The result was a CG face widely acclaimed to look and move exactly like Mr. Schwarzenegger's face at age 37.

3.   Sheldon Stopsack, *Terminator: Genisys* VFX Supervisor stated how MOVA Contour captured the subtle facial motions required for a believable age-37 CG face.

> "It is already difficult enough… to create a human being digitally. It becomes even more difficult if that human being is … such an iconic figure as Arnold Schwarzenegger."[5]

[1] http://www.boxofficemojo.com/movies/?id=terminator2015.htm

[2] http://www.boxofficemojo.com/franchises/chart/?id=terminator.htm

[3] E.g., Trailer #1, Dec. 4, 2014: https://www.youtube.com/watch?v=FqbOFjl7ZWE ; Trailer #2, Apr. 13, 2015 https://www.youtube.com/watch?v=jNU_jrPxs-0, and numerous other videos.

[4] "A battle for the ages. Get a preview of Arnold vs. Arnold in this exclusive #TerminatorGenisys clip. http://fandan.co/1Icc1JT", June 23, 2015. Paramount Terminator: Genisys Facebook promotional page. https://www.facebook.com/TerminatorGenisys/

[5] "Upgrades: VFX of Terminator Genisys", *Terminator: Genisys* Blu-ray featurette.

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> "…we had the opportunity to do a MOVA performance capture with Arnold Schwarzenegger himself… This gave us a basis of very subtle [facial] movements."[6]

3   4.   But neither Mr. Stopsack nor defendant Paramount ever mentioned that the acclaimed

4 cutting-edge digital MOVA Contour technology that made the photorealistic face of the CG

5 Terminator possible was stolen from its inventor and developer, Rearden LLC, and its owner

6 Rearden Mova LLC. Nor is it ever mentioned that, Paramount had contracted with Rearden LLC

7 and its controlled companies to use MOVA Contour in previous movies, including *The Curious Case*

8 *of Benjamin Button (2008)*, which won an Academy Award using MOVA Contour for its

9 groundbreaking reverse aging of Brad Pitt's CG face from an 87-year-old man backwards to his

10 then-age of 44, and then further backwards to a younger age, and in *Transformers: Dark of the Moon*

11 *(2011)*, which at $1.124 billion reached the 4th highest grossing movie of all time[7]. Nonetheless,

12 Paramount nonetheless secretly contracted with the thieves to use the stolen MOVA Contour facial

13 performance capture technology.

14   5.   And, nowhere is it mentioned that *after* Rearden and Rearden Mova were in widely-

15 reported litigation against the MOVA Contour thieves, Paramount continued to use the MOVA

16 Contour capture output in creating the Schwarzenegger age-37 CG face and then released the

17 *Terminator: Genisys* film, flaunting its unauthorized use of MOVA Contour to promote the movie.

18   6.   But throughout this entire time, Paramount never bothered to contact its longtime

19 MOVA Contour service provider Rearden LLC to ask any questions or to verify authorization to use

20 the MOVA Contour system, methods, trade secrets, or trademarks that Paramount knew Rearden

21 owned.

22   7.   Paramount used the stolen MOVA Contour systems and methods and Contour

23 Program output, made derivative works, and with Paramount Home Entertainment, reproduced and

24 distributed, and authorized performance and display of *Terminator: Genisys* in knowing or willfully

25 blind violation of Rearden Mova LLC's intellectual property rights. This case seeks all just and

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27   [6] Frei, Vincent, "Terminator Genisys: Sheldon Stopsack—VFX Supervisor—MPC", July 22, 2015, http://www.artofvfx.com/terminator-genisys-sheldon-stopsack-vfx-supervisor-mpc/

28   [7] http://www.boxofficemojo.com/alltime/world/

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1 equitable copyright and trademark remedies on behalf of the inventors and owners of the MOVA

2 Contour systems and methods, and Contour Program and output, plaintiffs Rearden LLC and

3 Rearden Mova LLC.

II.   THE PARTIES

5   8.   Plaintiff Rearden LLC ("Rearden") is a California limited liability company having its

6 principal place of business at 355 Bryant Street, Suite 110, San Francisco, California 94107.

7   9.   Plaintiff Rearden Mova LLC ("Rearden Mova") is a California limited liability

8 company having its principal place of business at 355 Bryant Street, Suite 110, San Francisco,

9 California 94107. Rearden MOVA is wholly owned by Rearden.

10   10.   Defendant Paramount Pictures Corporation ("Paramount") is a Delaware corporation

11 having its principal place of business at 5555 Melrose Avenue, Los Angeles, California, 90038.

12   11.   Defendant Paramount Home Entertainment Distribution Inc. ("Paramount Home

13 Entertainment") is a Delaware corporation, having its principal place of business at 5555 Melrose

14 Avenue, Los Angeles, California 90038. Paramount Home Entertainment is wholly-owned and

15 controlled by Paramount.

III.   JURISDICTION AND VENUE

17   12.   This Court has subject matter jurisdiction under 28 U.S.C. § 1331 (federal question

18 jurisdiction), and § 1338 (trademark and copyright jurisdiction).

19   13.   This Court has personal jurisdiction over defendant Paramount. It has general

20 personal jurisdiction over Paramount and Paramount Home Entertainment because their principal

21 places of business are in the State of California and they have the capacity to sue and be sued in the

22 State of California. And this Court has specific personal jurisdiction over Paramount and Paramount

23 Home Entertainment because they have committed acts in the State of California that give rise to all

24 claims of infringement asserted herein.

25   14.   Venue is proper for plaintiffs' copyright and trademark infringement claims under 28

26 U.S.C. § 1400(a) and 1391 (b), (c) and (d). Paramount used plaintiffs' MOVA service mark, made

27 derivative works, and with Paramount Home Entertainment, reproduced, distributed, and authorized

28 the performance and display of *Terminator: Genisys* throughout this judicial district.

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IV.   FACTUAL ALLEGATIONS

A.   The MOVA Contour systems and methods

15.   The technology at the core of this case includes MOVA Contour Reality Capture ("Contour" or "MOVA Contour") technology that was conceived and developed by plaintiff Rearden and is currently owned by Rearden MOVA, which is wholly owned by Rearden.

16.   MOVA Contour (http://www.rearden.com/mova.html) is one of many technologies incubated and offered by Rearden (www.rearden.com), a San Francisco Bay Area company founded in 1999 by Steve Perlman as an incubator for fundamental technology, creative works, and their interplay.

17.   MOVA Contour is the fourth performance motion capture technology that Rearden has used in film and videogame production since its founding 18 years ago. Facial performance motion capture, as both a technology and a tool for motion picture and videogame production, falls squarely within the focus of Rearden's business. Rearden practices all of its technologies and inventions, either directly or indirectly by spinning off Rearden entities to use its technologies and inventions. Despite holding a global portfolio of hundreds of its own patents, Rearden has never been in the business of licensing third parties to practice its technologies and inventions, and it has never licensed nor sought to license any of its technologies, inventions, patents, copyrights, or trademarks. Rearden's intellectual property portfolio exists only to protect Rearden's product and services offerings, and neither Rearden nor any of its controlled companies has ever previously sued any other person or entity for patent or copyright infringement before this matter.

18.   Mr. Perlman previously worked as Principal Scientist at Apple where he developed, among many other technologies, the multimedia underpinnings of the color Macintosh as well as QuickTime. He left Apple for two startups that later went public, and designed and co-founded WebTV, which was later acquired by Microsoft. Microsoft named Perlman President of a new Silicon Valley division focused on television products, which ultimately developed Microsoft's cable, satellite, IPTV and Xbox 360 systems. Perlman left Microsoft in 1999 and self-funded a technology incubator and visual effects production studio in San Francisco called Rearden, Inc. (now Rearden LLC). Rearden focused largely on developing fundamental media-related technologies

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1   whose development times (e.g. 5 to 15 years) are beyond the horizon of venture capital and corporate

2   research and development. Perlman has operated Rearden continuously through to this day. He is a

3   prolific inventor. Perlman is a named inventor on over 500 patents worldwide, and among his many

4   innovations are the following:

- The underlying technology for QuickTime (the video streaming technology for iPhone, iPad, iPod and Mac and much of the multimedia technology for Apple);

- The underlying technology for many of Microsoft's video products;

- OnLive cloud gaming technology;

- MOVA Contour facial capture technology;

- Artemis pCell wireless technology; and

- A wide range of other technologies in other fields, including medical and national defense life-saving technologies, often in cooperation with the U.S. government and U.S. agencies, sometimes not publicly disclosed.

14   19.   A major technology focus of Rearden is and has been "performance motion capture,"

15 a production technology typically used to create a 3D animated character in a film or videogame that

16 moves exactly like a human performer. In 2000, Rearden began offering motion capture services for

17 movies and videogames (through wholly-owned subsidiaries Rearden Studios and then MOVA LLC)

18 using existing commercial "marker-based" motion capture systems that could capture and track body

19 ("skeletal") motion, but there was no known technology at that time that could capture and track the

20 subtleties of human facial motion in a realistic, life-like manner, despite an urgent need:

> "The state of the art [before Contour] was … marker-based motion capture…we looked at a number of other films at the time that were using facial marker tracking…as you can see, it gives you a pretty crappy performance… What we realized was that what we needed was the information that was going on between the markers. We needed the subtleties of the skin. We needed to see skin moving over muscle moving over bone. We needed creases and dimples and wrinkles…" [8]

25 Rearden set out to invent and perfect a photorealistic facial motion capture and tracking system.

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[8] Ulbrich, Ed, "How Benjamin Button Got His Face" TED Talk, Feb 2009.
https://www.ted.com/talks/ed_ulbrich_shows_how_benjamin_button_got_his_face.

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20.   Over the next five years, Rearden's technical team tried dozens of different approaches to solve the problem, ultimately leading to the conception and perfection of a solution to the long-felt need—a technology that precisely captures and tracks the 3D shape and motion of a human face to sub-millimeter precision, producing photorealistic results. Rearden branded the technology Contour Reality Capture, and offered it as a service. This innovative technology was recognized in the motion picture industry as revolutionary:

> "Contour's promise is enormous," [Director David] Fincher said, "The notion that the human face in all its subtleties could be mapped in real time and such density of surface information opens up so many possibilities for both two- and three-dimensional image makers and story-tellers."

> "I live in this environment, and I see stuff every day, so I get a little jaded," said [Digital Domain Senior VP and Executive Producer Ed] Ulbrich… "Other developments have been gradual, more evolutionary than revolutionary. Contour separates the performance from the photography. It's a substantial turning point in the business, and I think it will change how picture are made."[9]

21.   MOVA Contour's technical breakthrough was introduced at the Special Interest Group on Computer Graphics and Interactive Techniques ("SIGGRAPH") Conference on July 31, 2006 to wide acclaim, including photographs of Contour's systems and methods on the front page of the *New York Times*[10], page B1 of the *Wall Street Journal*[11], and *The Hollywood Reporter*, among other publications. Mr. Perlman was invited to present MOVA Contour technologies and their practical applications in movie production to the Directors Guild of America[12]. And he was invited on many occasions to give public presentations on MOVA Contour and the development process that led to its invention, for example in a speech at Columbia University[13].

[9] Marlowe, Chris, "Contour mapping intricate detail: Mova revolutionizing motion-capture process with new system," The Hollywood Reporter, July 31, 2006, http://www.rearden.com/press/2006/Contour-HollywoodReporter-060731-2.pdf.

[10] Markoff, John, "Camera System Creates Sophisticated 3-D Effects", New York Times, July 31, 2006. https://nyti.ms/2uAfwGF.

[11] Wingfield, Nick, "Digital Replicas May Change Face of Films", July 31, 2006. http://on.wsj.com/2teIRbO.

[12] "'Facial Performance Capture for Photoreal Digital Characters' Presented by Steve Perlman, Founder & President, Mova", Digital Day 2007: The Future of the Future, Directors Guild of America, July 28, 2007. http://ishindler.com/articles/DGA_Digital_Day_flyer07.pdf.

[13] https://youtu.be/1QxrQnJCXKo.

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1   22.   The following photograph[14] from an article in *The Hollywood Reporter* on the day

2   MOVA Contour was unveiled—July 31, 2006—was directed to movie and videogame industry

3   professionals and illustrates several Contour Program output, which are described in further herein:
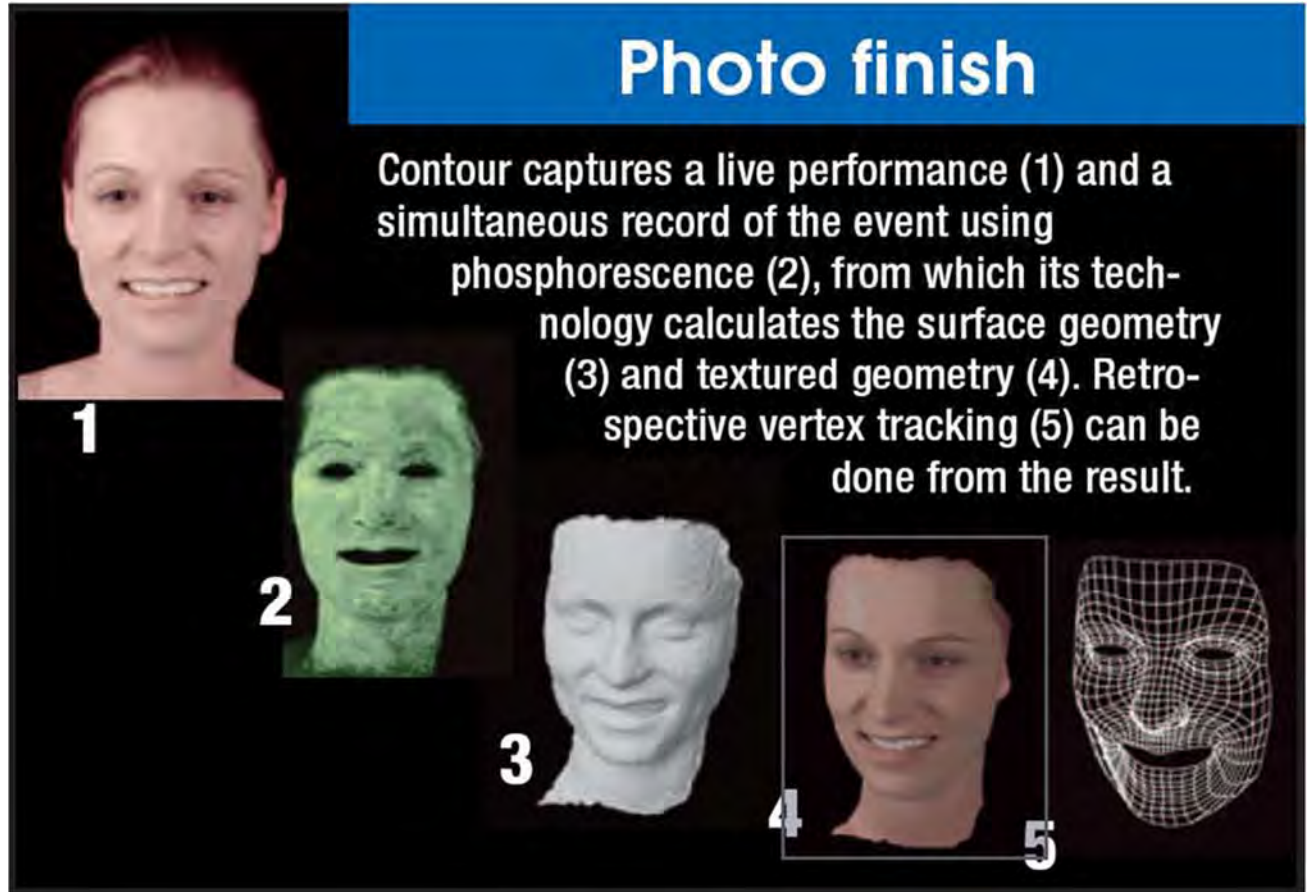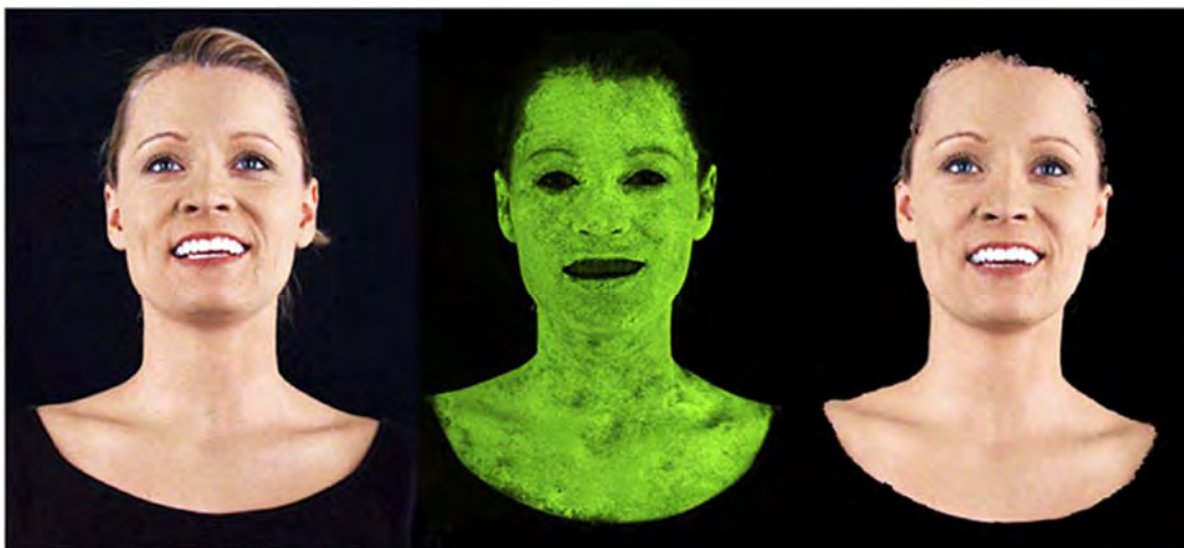

4   23.   Also on July 31, 2006, the following photographs appeared in a *New York Times*

article directed to a general readership audience, which illustrate an application of the phosphor-

based makeup used in MOVA Contour facial motion capture methods:

[14] Marlowe, op. cit.

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Actors must cover themselves with makeup containing phosphorescent powder for Contour, a system that can create 3-D effects. Austin Hice

and stills from three Contour Program output (this photograph appeared on the front page):[15]
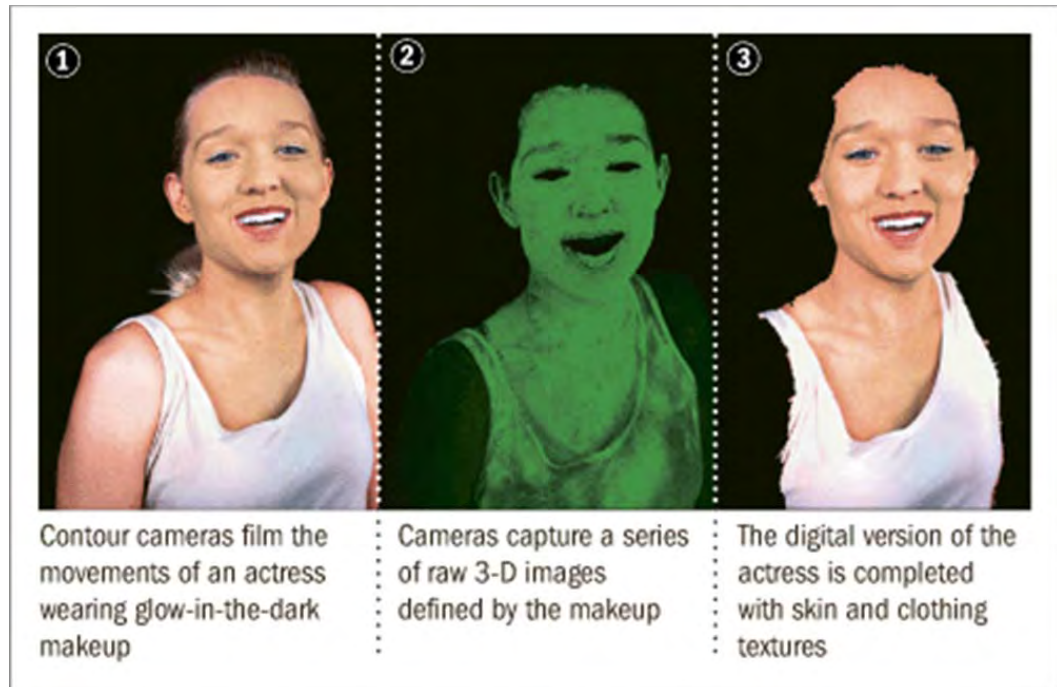

An actress goes from live performance, left, to phosphorescence, to a Contour-generated image, right. Mova.com

24.   Also on July 31, 2006, the following photograph appeared in a *Wall Street Journal* article directed to a general readership audience, which illustrates the same three Contour Program output with "non-technical reader" annotations for each image (the web version of the article included a video that showed the three output in motion):[16]

_____

[15] Markoff, op. cit.

[16] Wingfield, op. cit.

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① Contour cameras film the movements of an actress wearing glow-in-the-dark makeup

② Cameras capture a series of raw 3-D images defined by the makeup

③ The digital version of the actress is completed with skin and clothing textures

25. In one embodiment, MOVA Contour uses an array of cameras whose shutters are synchronized to strobing white lights and ultraviolet lights ("black lights") in conjunction with phosphor-based makeup applied to the performer in random patterns, with the entire system controlled by highly-advanced and proprietary MOVA Contour software that operates the Contour system in real time to capture an actor's performance frame-by-frame, and then creates original Contour Program output based on the performance, frame-by-frame.

26. The Contour system is controlled, and the captured camera images are processed, by several computers running copyrighted software. Some of the software operates prior to a facial capture session to prepare and calibrate the Contour system, some operates in real-time during a live facial capture, and some operates after the facial capture. Collectively, this Contour software is referred to herein as the "Contour Program." The Contour Program produces several types of output, some of which are used by the Contour Program itself for further processing, and others of which are used for driving a CG face in a movie or videogame.

27. One embodiment of the operation of the MOVA Contour system and methods, and the Contour Program, is described in the following page from a MOVA Contour brochure below, which was distributed at computer graphics and entertainment industry conferences:

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28.   **Preparation:** Phosphor-based makeup (various types of phosphor are supported) is applied in a random pattern on the performer's face, neck, etc.—whatever body surfaces are intended to be captured—typically using an airbrush, sponge or cotton swab.

29.   **Lights:** The performer sits or stands in the arc-shaped Contour rig in a light-sealed stage. One part of the Contour Program causes white lights and black lights to be flashed so rapidly that the flashing is beyond human perception and it appears to the performer and observers that the lights are on steadily. Typically fluorescent lamps or LEDs are used.

30.   **Cameras:** One part of the Contour Program causes the shutters on two pluralities of cameras, distributed around the rig, to open and close synchronously with the flashing of the lights such that:

(a)   a first plurality of cameras open their shutters when the white lights are on, illuminating the natural skin color of the performer; and

(b)   a second plurality of cameras open their shutters when the white lights are off and the phosphor-based makeup is emitting random patterns of light (typically in green or blue).

31.   **Action:** The performer provides her or his facial performance while one part of the Contour Program causes the output of each of the plurality of cameras to be recorded onto storage devices. The output of the two pluralities of cameras are illustrated in each half of the face in the "Capture Process" section of the brochure reproduced above.

(a)   the output of the first plurality of cameras is called herein the "**Skin Texture**" and it looks like normal skin and facial features of the performer from multiple angles, largely without visible makeup, and

(b)   the output of the second plurality of cameras is called herein the "**Makeup Pattern**" and it looks like a random pattern of green or blue largely without showing the skin or other facial features (e.g. eyes or mouth) of the performer.

32.   The Contour Program uses the Makeup Pattern output to compute a high-resolution 3D surface that moves in the shape of the skin of the performer with sub-millimeter precision. This

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output is called herein the "**Captured Surface**" and, rendered on a display, it looks like a 3D bust of

the performer's skin in motion. A still frame of a Captured Surface is shown in the "Captured

Surface" section of the brochure reproduced above.

33.   The Contour Program also uses the Makeup Pattern output to compute a high-

resolution 3D mesh that tracks 3D points on the skin of the performer as the skin moves from frame-

to-frame. This output is called herein the "**Tracking Mesh**" and, rendered on a display, it looks like

a 3D mesh that exactly follows the movement, stretching and wrinkling, etc., of the skin as the

performer moves her or his face. A still frame of a Tracking Mesh is shown in the "Tracked Surface"

section of the brochure reproduced above. The Tracking Mesh tracks the subtleties of the

performer's facial motion with sub-millimeter precision. For example, if the performer's expression

causes the cheeks to bulge out from a smile, the 3D points on the mesh tracking the cheek will bulge

out in exactly the same 3D shape. If the forehead furrows into wrinkles, then the 3D points on the

mesh tracking the forehead will furrow into wrinkles in exactly the same 3D shape. The Tracking

Mesh can be configured to be at any resolution, whether thousands or even millions of 3D points,

depending on the level of tracking detail required by the project. An example of a Tracking Mesh

tracking skin deformation from an extreme expression is shown here:

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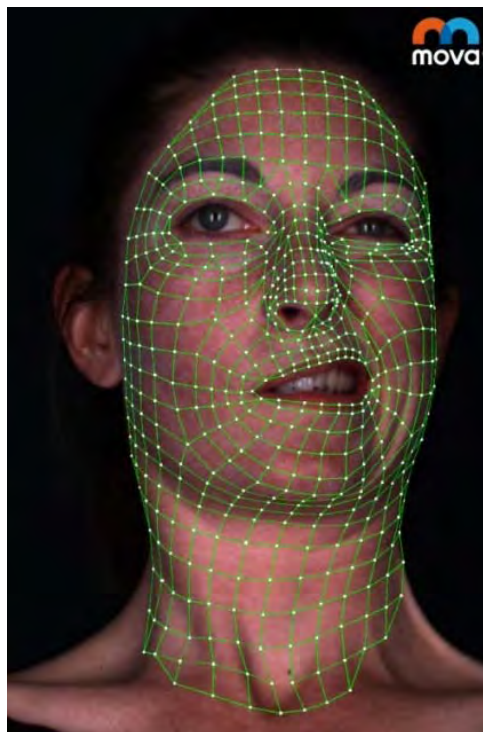
34.   The Contour output specified above can be used for many different applications. Often they are used for "retargeting" the performer's face onto another 3D model of a face, either a real face (e.g. when Rupert Grint (Ron Weasley) transforms into the face of Daniel Radcliffe (Harry Potter) in *Harry Potter and the Deathly Hallows, Part I*), or a fictional face (e.g. Mark Ruffalo's face transforms into the Hulk's superhero face in *The Avengers*, Brad Pitt's 44-year-old face retargeted to an 87 year-old version of his face in *The Curious Case of Benjamin Button*), or Jeff Bridge's face retargeted in *TRON: Legacy* (2010) to his 28 year-younger face as it appeared in *TRON* (1982).

35.   When the retargeting is from a first performer's real face to the real face of a second performer, then each performer's face is captured by the Contour system, with output created by the Contour Program for each performer. The Captured Surface, Tracking Mesh, and Skin Texture output can be used in the construction of a 3D model of the face of the second performer, and then the Tracking Mesh of the first performer is used to control the 3D model of the second performer's face. The result is a 3D model of the face of the second performer that is controlled by the motion of the first performer's face. For example, the photograph below shows a man (the "second performer") captured by Contour. The 3D model of a CG head (center) was generated from the Contour Program output, including the Makeup Pattern (left) and Tracking Mesh (right):

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36.   The photograph below shows the performance of the woman (the "first performer") in the brochure reproduced above (showing her Skin Texture (left) and Tracking Mesh (right) Contour output) retargeted to the man's CG head in the above photo by retargeting the 3D points on her Tracking Mesh to the 3D model of the man's CG head. As you can see in her Live Performance (showing the Skin Texture output, below left), her facial expression causes the man's CG head to track her facial expression. Contour's Tracking Mesh is so precise that a high degree of realism is maintained, even though the man's CG face and head have a very different shape and size than hers, and he is male and she is female. In fact, Contour output capture the woman's performance with such fidelity that observers of the animation have commented that despite the fact that the man's CG face clearly has a male *shape*, the *motion* appears to be that of a female face. The video of this and other Contour examples is available on Rearden's home page (www.rearden.com, click on the MOVA logo and click on the video), or directly (www.rearden.com/mova.php or https://vimeo.com/86130623):

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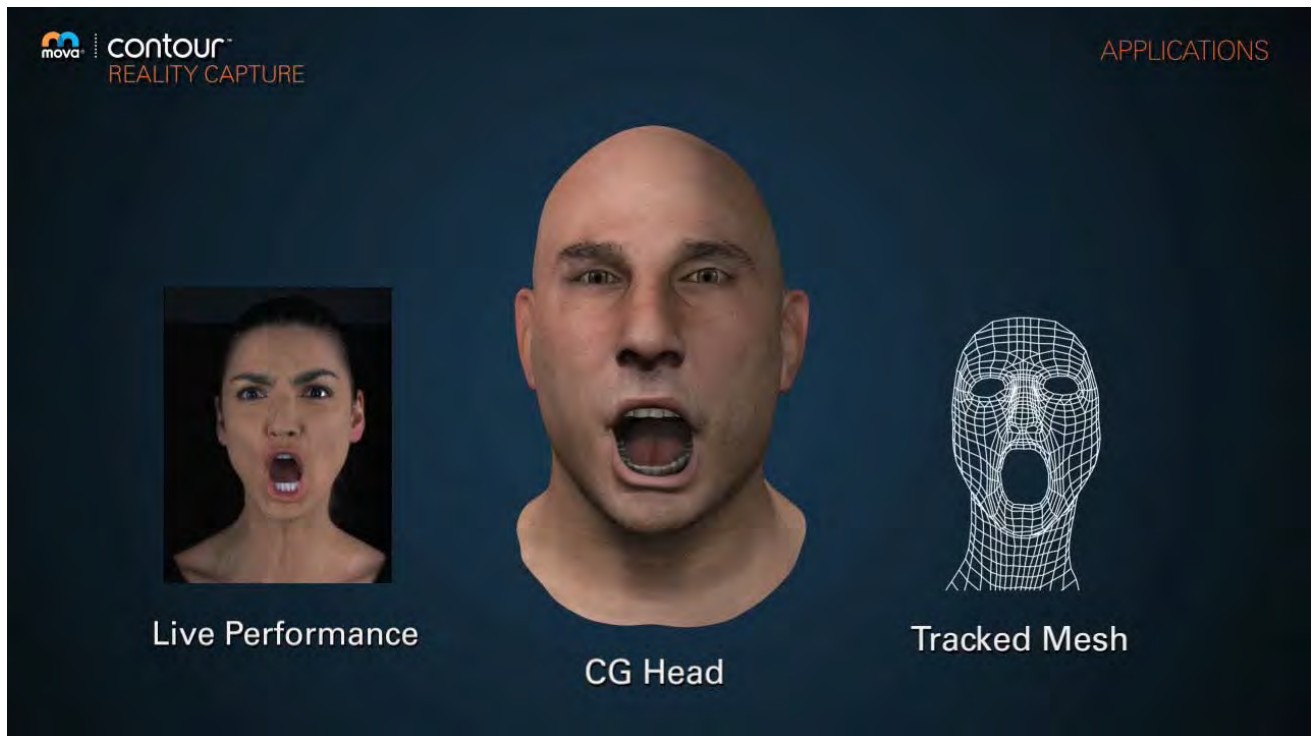
37.   A similar retargeting process can be performed with a fictional head. For example, the two photographs below are of a performer whose face was captured in the Contour system showing the Skin Texture output on the left and how she appeared to the naked eye (or a conventional camera), showing the Makeup Pattern combined with Skin Texture on the right:

38.   The photograph below shows several views of a CG model of the head of a videogame character that was created by an artist:

Although the head looks almost photoreal when in a neutral pose and immobile, if the face were animated—whether by hand-drawn animation or prior motion capture techniques—any photorealism would be lost because the human eye and brain are precisely attuned to notice any unnatural imperfection in facial motion. But, by using the Contour system and methods and the Contour Program, every subtle motion of the human face is captured with sub-millimeter precision, producing output that retain that precision and that can be retargeted to any CG head, bringing it to life.

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39.   The photographs below show the above videogame character's head in two expressions retargeted from the Tracking Mesh generated by the Contour Program from the Contour facial capture of the above actress. Although the photorealism of the motion cannot be seen in static photographs, the motion is realistic and life-like, despite the fact that the performer's face is a very different shape than that of the CG head. Even in a static image, however, one can see how the expressionless CG model tracked the good-natured expression of the actress:

40.   A 3D "wireframe" (a mesh of 3D points) of the retargeted CG Character's head is shown below separately, overlaid upon the rendered image, and then the final rendered image:

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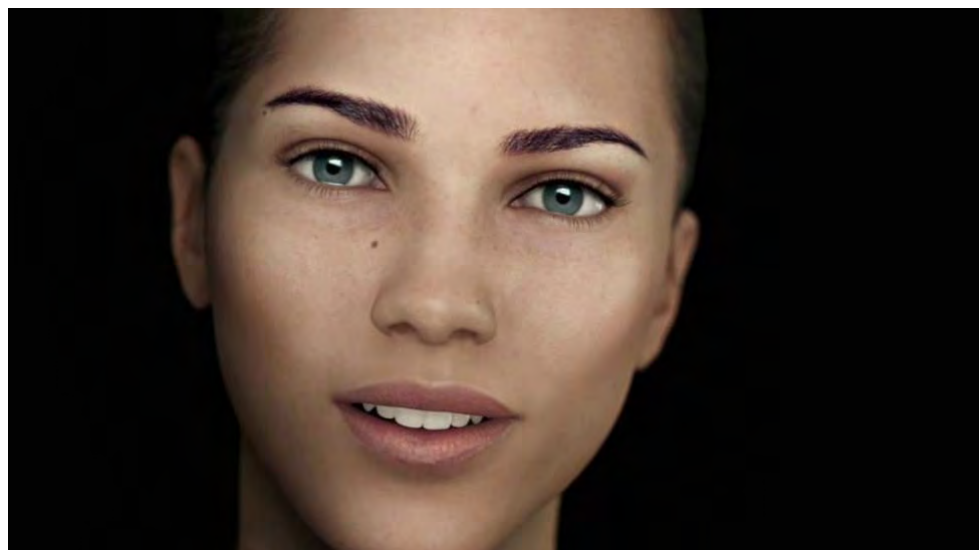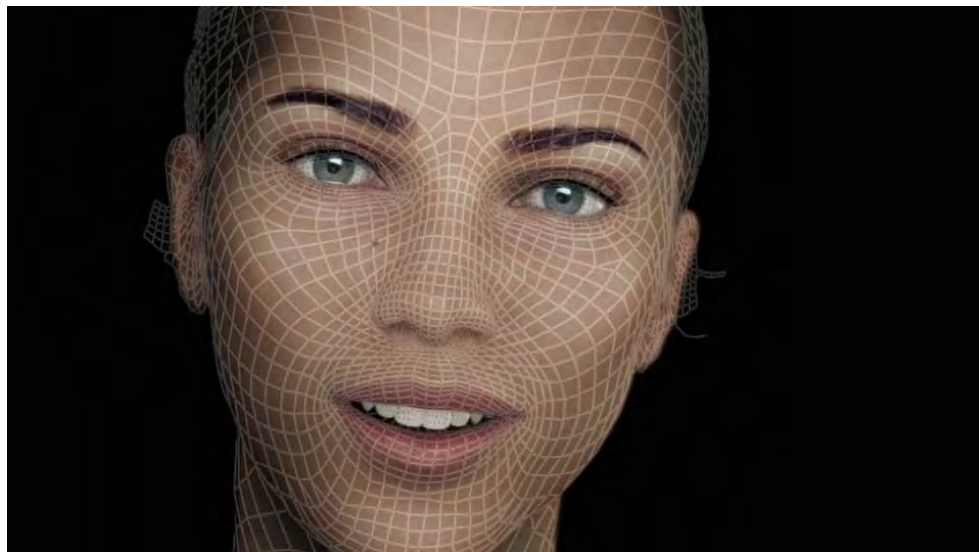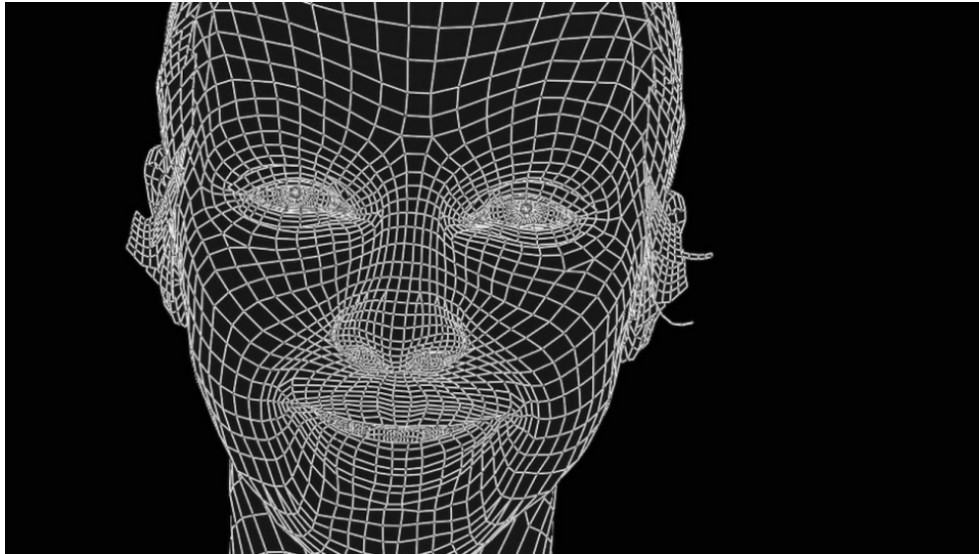
41.   In summary, the MOVA Contour Program does substantially all of the work in the process of precisely transforming the facial performance of a live performer, capturing the most subtle of facial motions with sub-millimeter precision to drive the life-like motion of faces of CG characters that appear in a finished movie, videogame, or other production, or utilized for other applications. The process begins by airbrushing or otherwise applying a random pattern of phosphor-based makeup on a performer, having the performer sit or stand in the arc-shaped Contour rig surrounded by an array of white lights and black lights and two pluralities of cameras, with the lights flashed rapidly and synchronized with the camera shutters as Skin Textures and Makeup Patterns are captured by the Contour Program. The Contour Program then processes the Makeup Pattern to capture thousands or even millions of 3D points as the performer's face moves, producing precise Captured Surface and Tracking Mesh files. Thus, the Contour Program produces output that includes the following:

- **Skin Texture**, showing the normal skin and facial features of the performer from multiple angles, largely without visible makeup

- **Makeup pattern**, showing the random pattern of makeup on the performer from multiple angles, largely without visible skin or facial features

- **Captured Surface**, a high-resolution moving 3D surface in the shape of the performer's skin as the performer's face moves

- **Tracking Mesh**, a high-resolution 3D mesh that exactly tracks the movement, stretching, wrinkling, etc. as the performer moves their face.

The Tracking Mesh can then be retargeted to a CG face, driving that CG face with photorealistic and natural motion, thereby precisely preserving every subtlety of human expression by the performer in the final movie, videogame, or other production.

42.   Within days after the Mova Contour Program, system and methods were unveiled at SIGGRAPH in 2006, tests and production began on one of the first movies utilizing MOVA Contour, *The Curious Case of Benjamin Button.* The movie was released in 2008. The photorealistic reverse-aging of Brad Pitt's face from an 87-year-old man backwards to his then-age of 44, and then

further backwards to a younger age, was widely lauded as a visual effects ("VFX") milestone, the

first ever photorealistic CG face, winning an Academy Award for Best Visual Effects for the team at

the VFX production company, Digital Domain, which had hired Rearden to operate the MOVA

Contour system to capture Brad Pitt's face and generate Contour Program output for the film.

43.   In a widely-viewed TED (Technology, Entertainment, Design) Talk entitled, "How

Benjamin Button Got His Face," Ed Ulbrich, Digital Domain's Senior VP and Executive Producer

(subsequently the CEO of successor Digital Domain 3.0, Inc.), confirmed that *The Curious Case of*

Benjamin Button would have been "impossible" to make but for MOVA Contour's system and

methods and the unprecedented facial capture precision and subtlety of the MOVA Contour

Program's output. Ulbrich stated in the talk:

> "We first got involved in *The* [*Curious Case of Benjamin Button*]
> project in the early 90s.... We took a lot of meetings and we seriously
> considered it. But at the time, we had to throw in the towel. **It was
> deemed impossible**. **It was beyond the technology of the day to
> depict a man aging backward**... The project came back to us a decade
> later.... **we came across a remarkable technology called Contour**…
> creating a surface capture as opposed to a marker capture…**This was
> when we had our 'Aha!' This was the breakthrough**…we could put
> Brad [Pitt] in this [Contour] device, and use this Contour process, and
> we could stipple on this phosphorescent makeup and put him under the
> black lights, and we could, in fact, scan him in real time… effectively,
> we ended up with a [Contour Program output] 3D database of
> everything Brad Pitt's face is capable of doing…we could transpose
> the [Contour Program output] data of Brad at [then-aged] 44 onto [a
> 3D model of] Brad at 87. So now, we had a 3D database of everything
> Brad Pitt's face can do at age 87, in his 70s and in his 60s."[17]

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[17] Ulbrich, op. cit. (emphasis added).

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44.   In the TED Talk, Ulbrich showed details of the MOVA Contour system and methods, Contour Program output, and how the CG face of Benjamin Button in the final movie was derived from the Contour Program output. The following paragraphs describe still frames from the TED talk (labeled by "Minutes:Seconds" from the start of the video).

45.   **9:43:** The branded MOVA Contour "rig", a semicircle of two pluralities of cameras with synchronized white lights and black lights surrounding a performer, with MOVA staff operating the Contour system:
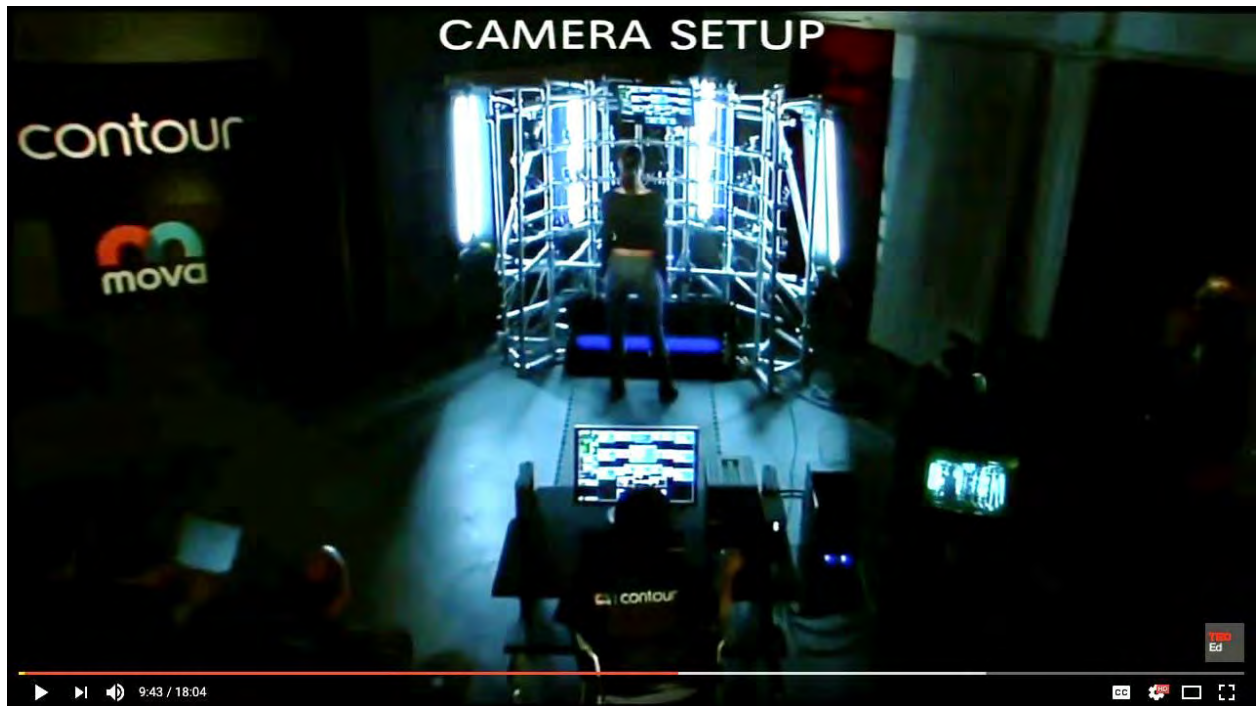
46.   **10:11:** On the left, Contour Program **Skin Texture** output, showing the performer's natural skin color and facial features. On the right, a performer with conventional motion capture markers on her face:

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47.   **10:17:** On the left, Contour Program **Tracking Mesh** output, showing hundreds of thousands of 3D points, the Tracking Mesh resolution is so high that the points can only be seen by zooming in. In contrast, conventional marker-based resolution is shown on the right:

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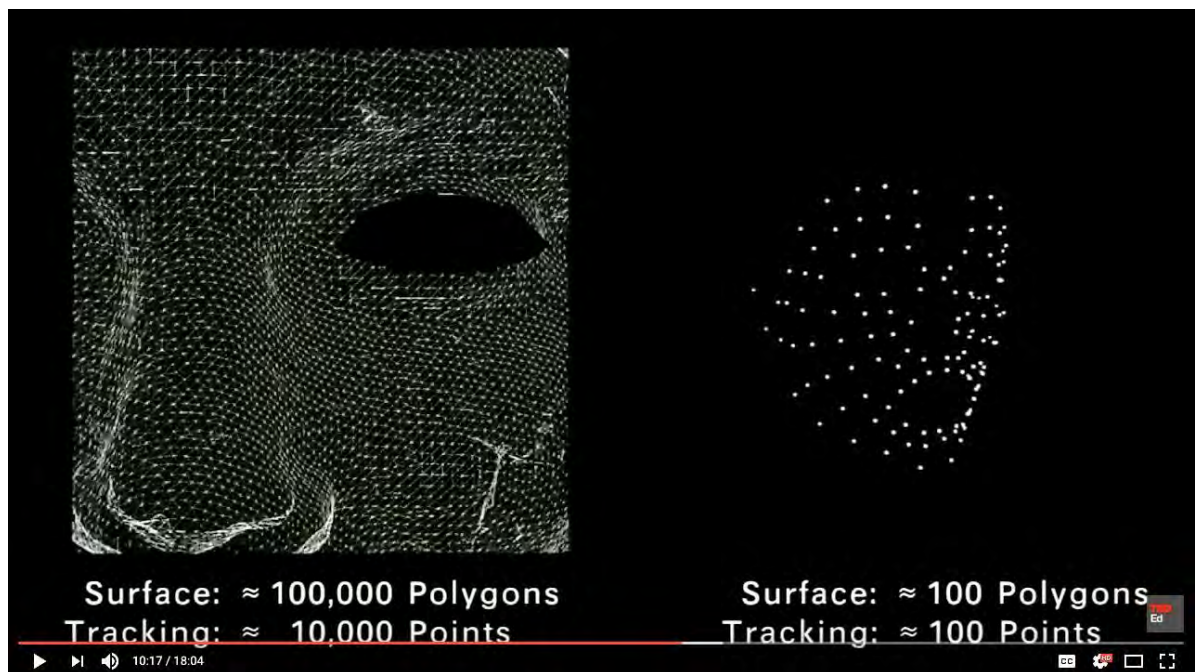
48.   **10:20:** On the left Contour Program **Captured Surface** output, showing high-resolution surface geometry. In contrast, marker-based facial capture surface geometry on the right:

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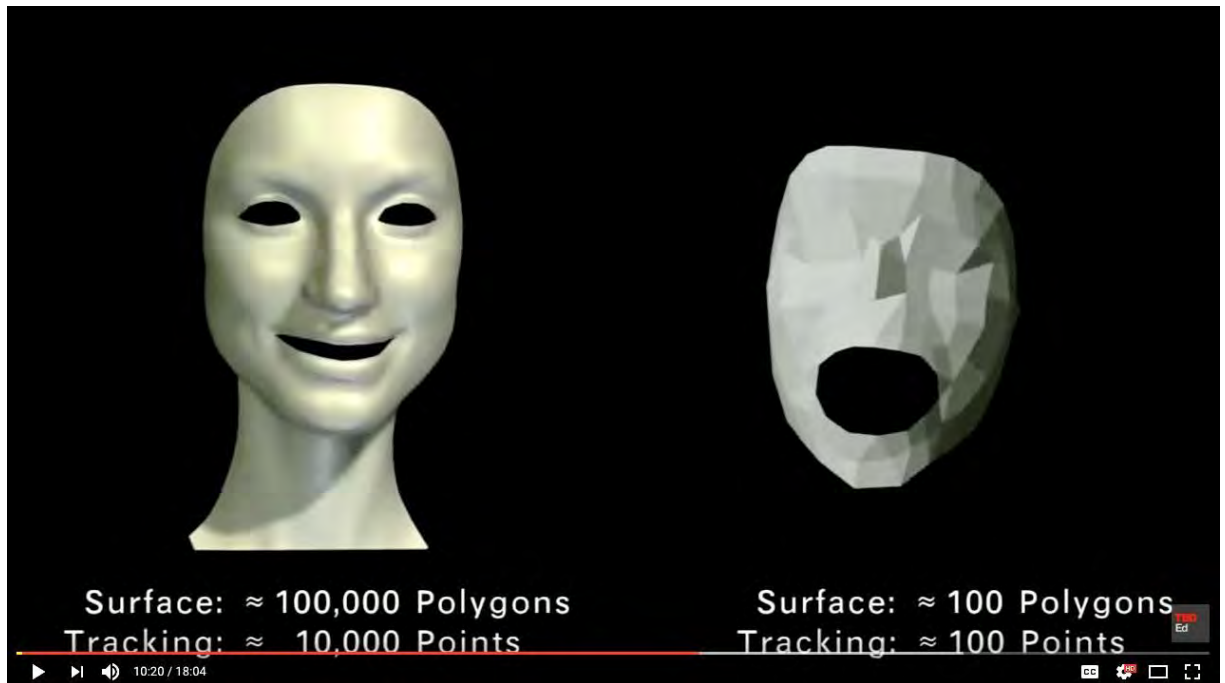
49.   **10:39:** Contour Program **Makeup Pattern** output, showing random patterns of phosphor-based makeup. Each of the four Contour facial captures of Mr. Pitt was a separate motion facial performance used for a different facial expression of Benjamin Button. The Contour Program created high-resolution **Captured Surface** and **Tracking Mesh** output from each of these:
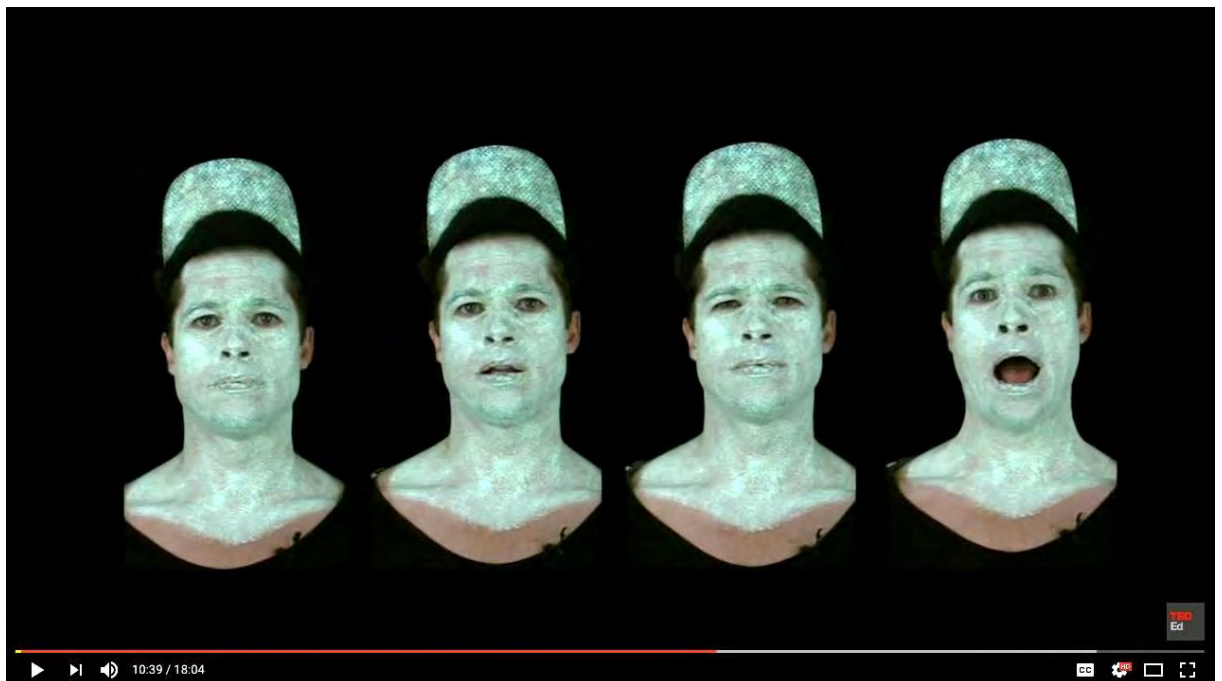
50.   **10:49:** Contour Program **Makeup Pattern** output, showing how many Contour outputs were used. Each of the Contour facial captures was a separate motion facial performance of Mr. Pitt used for a different facial expressions of Benjamin Button. The Contour Program created high-resolution **Captured Surface** and **Tracking Mesh** output from each of these, creating a database of Capture Surface and Tracking Mesh Contour output:

51.   **12:33:** Contour Program **Makeup Pattern** output (left), **Captured Surface** output (middle), retargeted **Captured Surface** and **Tracking Mesh** output to a derivative fictional aged head (right), are shown below. The 3D points of the Contour **Tracking Mesh** output of Mr. Pitt's actual face were retargeted to corresponding 3D points on the fictional "maquette" (i.e. hand-made 3D bust) of Mr. Pitt at age 87. As a simple example, the 3D point on the right corner of Mr. Pitt's actual mouth could correspond to the 3D point on the right corner of the 3D maquette's mouth. As Mr. Pitt's smile widens during the Contour capture session, moving the tracked 3D point on the corner of his mouth outward, the retargeted 3D point on the maquette's mouth would move proportionately outward causing the 87-year-old smile to widen. As described by Mr. Ulbrich: "[Left:] This is Brad doing one of the [character expression] poses. [Middle:] And here's the resulting [**Captured Surface** output] data that comes from that, the model that comes from that. [Right:]

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Retargeting is the process of transposing that [**Captured Surface** and **Tracking Mesh** output] data onto another model. And because the life cast, or the bust—the maquette—of Benjamin was made from Brad, we could transpose the [**Captured Surface** and **Tracking Mesh** output] data of Brad at 44 [years] onto Brad at 87[years]. Effectively, we ended up with a [**Captured Surface** and **Tracking Mesh** output] 3D database of everything Brad Pitt's face is capable of doing…we could transpose the [**Captured Surface** and **Tracking Mesh** output] data of Brad at [then-aged] 44 onto [a 3D maquette of] Brad at 87. So now, we had a 3D database of everything Brad Pitt's face can do at age 87, in his 70s and in his 60s":
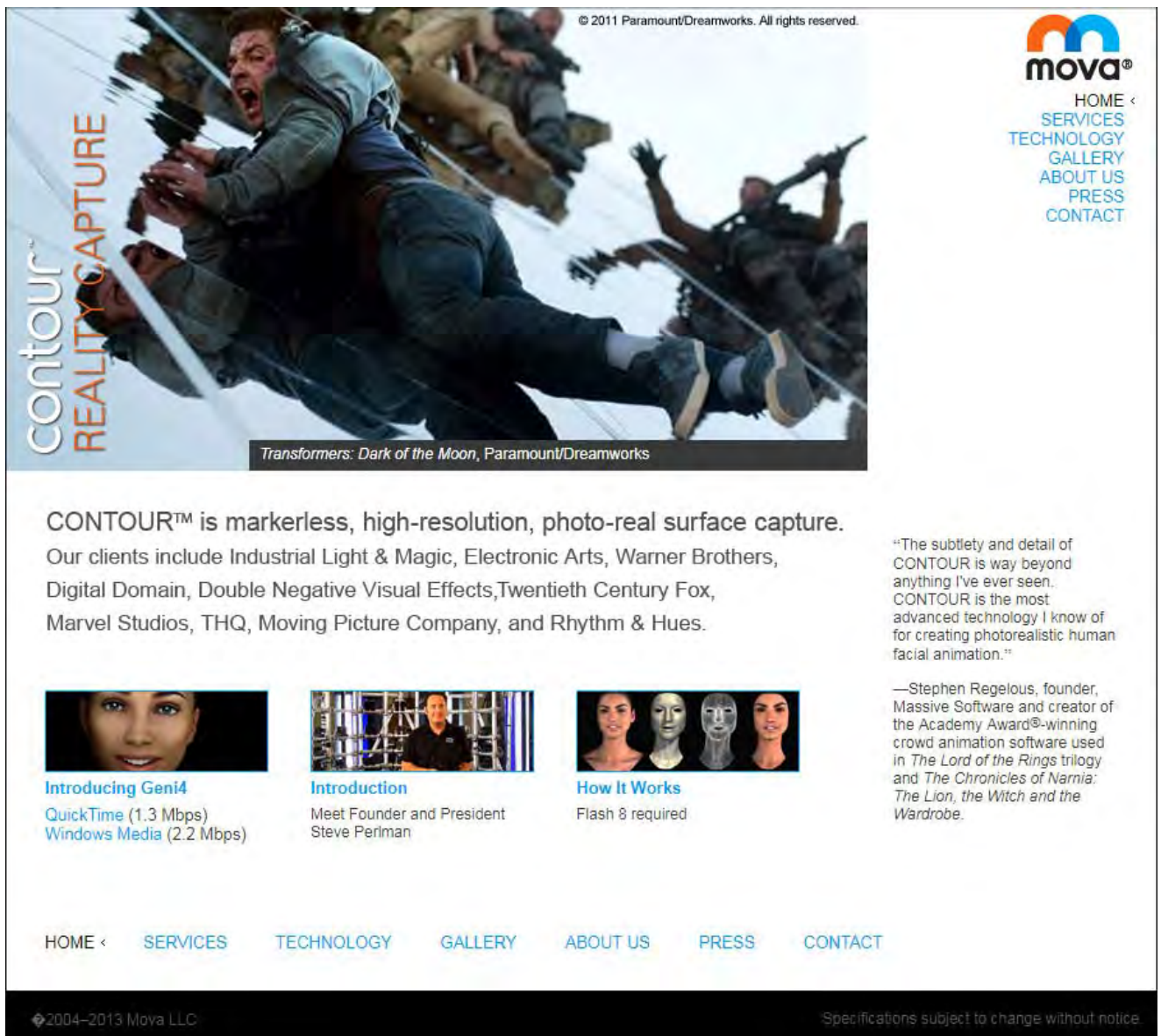
52.   **17:18:** On the left is 87-year-old fictional head maquette Tracking Mesh retargeted from, and derivative of, a Contour Program **Tracking Mesh** output, with a pair of glasses added in as a prop. The final derivative face is shown on the right after various steps such as texturing and lighting that is applied to the maquette. The resulting derivative face is integrated into the live-action footage of the final scene, producing the final derivative work:

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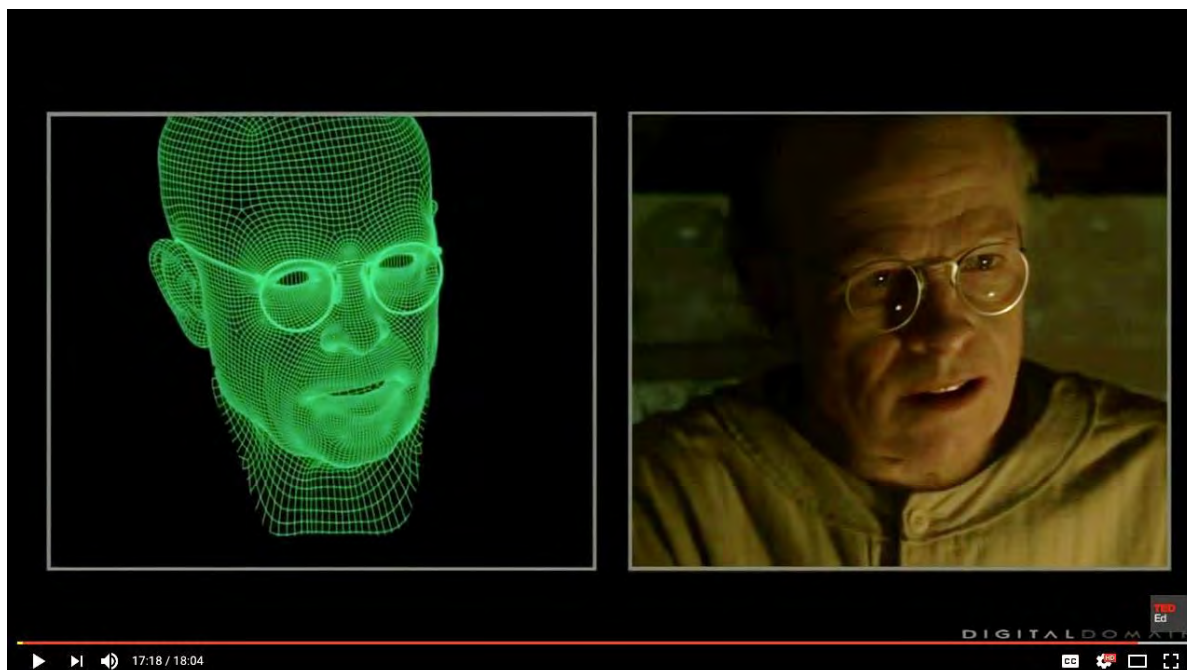
53.   The photorealistic reverse-aging derived from the MOVA Contour system, methods and output received wide acclaim when *The Curious Case of Benjamin Button* was released by defendant Paramount in December of 2008 and on February 22, 2009 won an Academy Award for Best Visual Effects for the photorealistic face based on Mova Contour output. Shortly thereafter the credibility gained from the Academy Award brought in new MOVA Contour projects from studios. MOVA Contour had been used in one other movie in 2008, *The Incredible Hulk*, which demonstrated how, in addition to transforming an actor's age, the same MOVA Contour output can be used for many other VFX purposes, such as transforming an actor's face into a creature.

54.   And in November 2010, defendant Paramount contracted with Rearden-controlled MOVA LLC to use MOVA Contour to lawfully capture an actor in *Transformers: Dark of the Moon*. A still from the film was featured on the home page of MOVA LLC's website, shown in the photograph below:

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20 55.   The following four photographs show the arc-shaped Contour rig, two pluralities of

21 synchronized cameras, white light and black light sources, computers running the Contour Programs,

22 and actors wearing the phosphor-based makeup of the MOVA Contour systems and methods, used

23 lawfully by defendants and operated by Rearden and its controlled companies in *The Curious Case*

24 *of Benjamin Button* (2008) and in *Transformers: Dark of the Moon* (2011) (Mr. Perlman appears at

25 the right in the last photograph):

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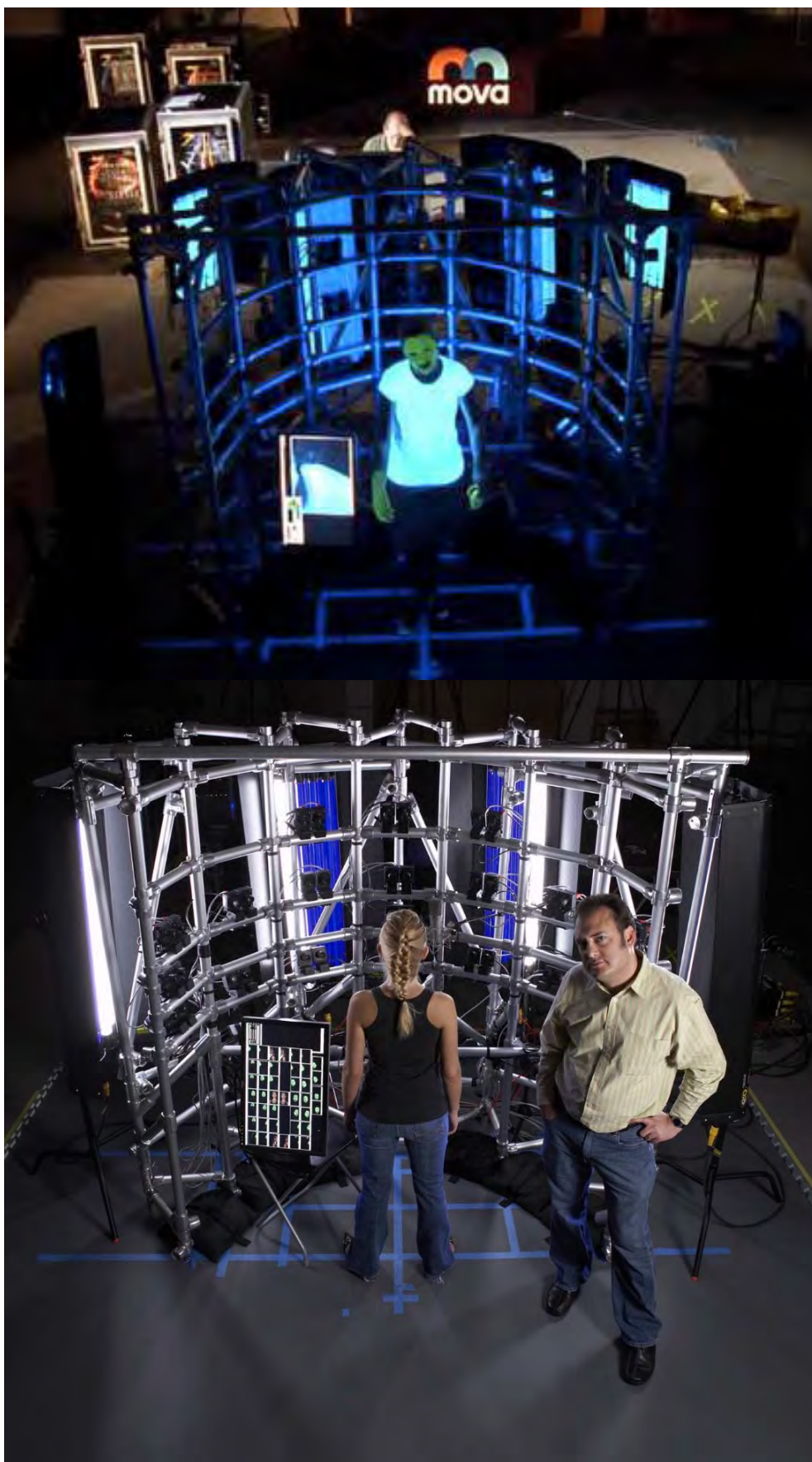
56.   And the following photograph released by Digital Domain shows the stolen MOVA Contour rig that was operated by the thieves and used unlawfully by Paramount in at least *Terminator: Genisys*. Close inspection of the photo shown in the left inset shows the thieves neglected to remove a Rearden, Inc. Asset Tag on one of the stolen cameras (Rearden, Inc. is Rearden LLC's predecessor in interest). Rearden Asset #10393 is a Basler 102f Camera, Serial # 20606024, purchased on October 1, 2006 and stolen in 2013. Also, numerous tell-tale details specific to Contour's operation are visible in the stolen Contour rig photograph (e.g. the right inset shows black tape is wrapped around the end of a fluorescent lamp tube to prevent light spillage from the glowing electrode, a Contour-specific technique taught in Rearden Mova's US Patent 7,567,293 at 19:66-20:15), confirming that the thieves were using Rearden's stolen system:

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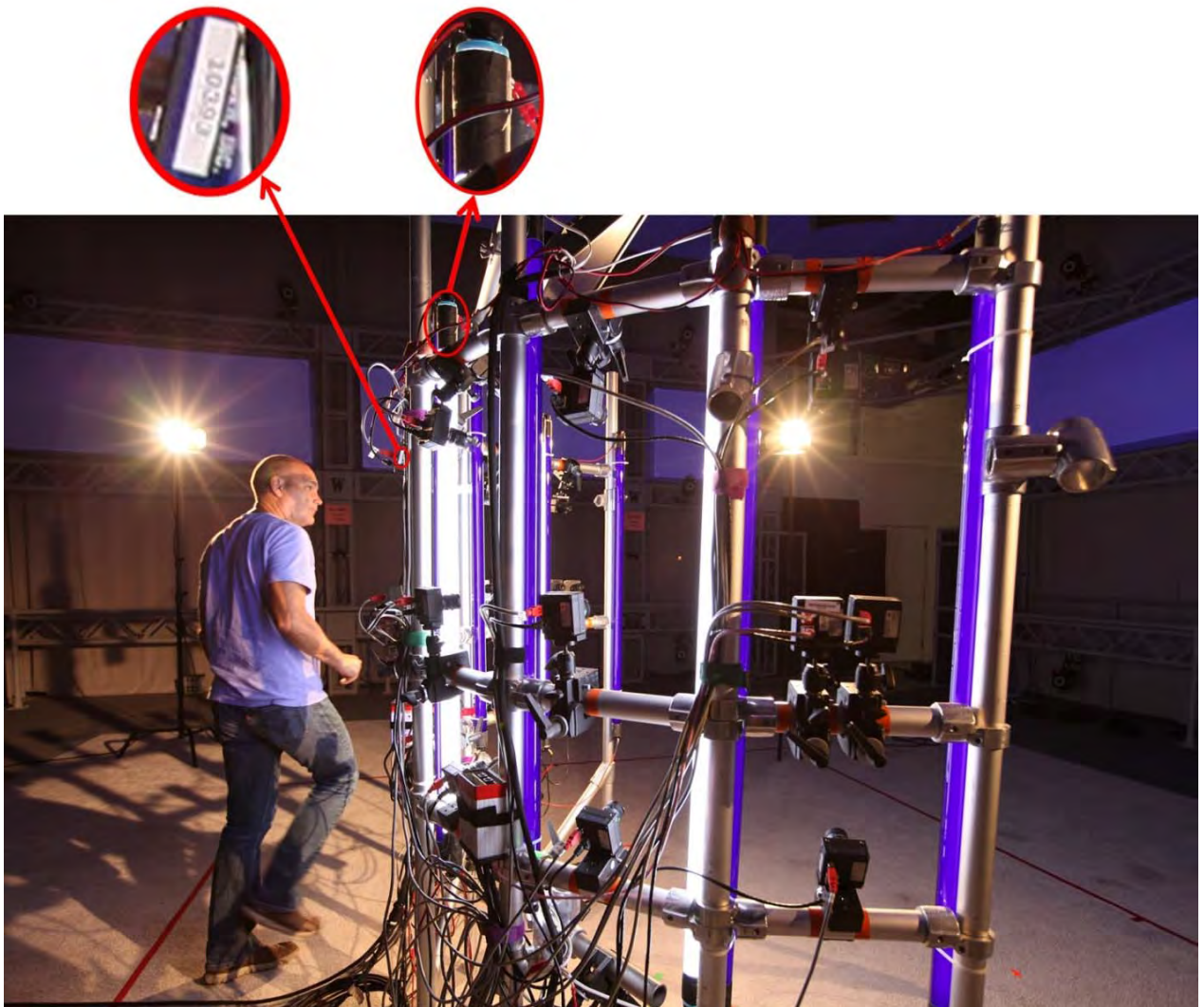
1   57.   The Contour system has no "operating manual." It is a hand-built system, the

2   operation of which is known only by Rearden's MOVA team who invented it and Rearden's MOVA

3   employees and contractors who were trained to use it under strict confidentiality duties. It was not

4   intended to be an end-user system and must be used carefully with knowledge of its operation to

5   function correctly and safely. Paramount was able to use the Contour system only because it had

6   engaged, either directly or in concert with entities subject to its supervision and control, former

7   Rearden employees to operate Rearden's Contour system using Rearden trade secrets without

8   authorization.

9   **B.   The MOVA Contour intellectual property**

10   58.   The MOVA Contour computer program is the subject of United States Copyright

11   Registration No. TXu001977151, a copy of which is attached hereto as Exhibit 1. Plaintiff Rearden

12   Mova is the owner of Copyright Registration No. TXu001977151. The MOVA Contour Program

13   runs on computers that are part of the MOVA Contour physical apparatus.

14   59.   The MOVA Contour methods and systems are the subject of issued United States

15   Patent Nos. 7,605,861 (the "'861 Patent"), 8,659,668 (the "'668 Patent"), 7,548,272 (the "'272

16   Patent"), 7,567,293 (the "'293 Patent"), and 8,207,963 (the "'963 Patent"), as well as numerous

17   United States pending patent applications, and international patents and patent applications. Plaintiff

18   Rearden Mova is the exclusive owner of the '861, '668, '272, '293, and '963 patents, as well as all

19   other domestic patent applications and all international patents and patent applications drawn to the

20   MOVA Contour systems and methods. The Mova Contour physical apparatus and methods are

21   embodiments of the claims of the '861, '668, '272, '293 and '963 patents.

22   60.   MOVA® and Contour® are the subject of United States Trademark Registration Nos.

23   U.S. Registration No. 3,843,152 and U.S. Registration No. 3,628,974, respectively. Copies of these

24   registrations are attached hereto as Exhibits 2 and 3.

25   61.   The MOVA Contour systems and methods include know-how, confidential

26   information that derives independent economic value, both actual and potential, from not being

27   generally known to the public or other persons who can obtain economic value from its disclosure

28   and use. The MOVA Contour confidential information includes, without limitation:

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- the source code and object code used in operating the MOVA Contour physical assets;

- many specific functionally-designed mechanisms, such as determining when part of the face is obstructed from the view of certain cameras and seamlessly filling in those parts of the face with views from other cameras;

- certain of the processes used along with the MOVA Contour physical assets, such as the timing configurations for the Mova system;

- sequencing the steps of calibration, aperture adjustment and focus adjustment of the Mova cameras;

- specific phosphor-based makeup formulations;

- techniques for applying makeup to performers being captured;

- specific electrical set up safety measures of the MOVA Contour rig;

- specific electrical modification of fluorescent light ballasts so as to operate safely;

- specific performer medical considerations, such as, in the case of performers receiving Botox treatments for facial wrinkles, scheduling shoots in specific intervals relative to their treatments to maintain natural skin motion;

- specific instructions to performers on how to perform in such a way to keep their faces within the capture volume;

- specific instructions to performers for specialized moves, such as singing, or bending the head downward and upward, with the face going out of and then back into view of the cameras; and

- information regarding MOVA's prior customer relationships and business terms.

62.   Rearden and Rearden Mova have protected this confidential information by, *inter alia*, maintaining email, documents, source and object code, and other software in secure locations; controlling access to these locations; and by including confidentiality terms in its agreements with all employees and contractors who have ever had access to any source code, object code other software, electrical set up, proprietary electrical circuit designs, timing systems, interconnects, makeup formulations, phosphor research, results of proprietary tests, etc. The following confidentiality terms

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1 of a Rearden employment agreement (Rearden referenced as "the Company"), for example, are

2 representative of those in all other Rearden employment and contractor agreements:

3 ▪ "At all times, both during my employment by the Company and after its termination, I will

4 keep in confidence and trust and will not use or disclose any Proprietary Information or

5 anything relating to it without the prior written consent of an officer of the Company..."

6 ▪ "I agree that during my employment by the Company I will not remove any Company

7 Documents and Materials from the business premises of the Company or deliver any

8 Company Documents and Materials to any person or entity outside the Company, except as I

9 am required to do in connection with performing the duties of my employment. I further

10 agree that, immediately upon the termination of my employment by me or by the Company

11 for any reason ... I will return all Company Documents and Materials, apparatus, equipment

12 and other physical property, or any reproduction of such property ..."

13 63. The MOVA Contour confidential information constitutes trade secrets as that term is

14 defined in the California Uniform Trade Secrets Act ("CUTSA") at sections 3426 to 3426.11 of the

15 California Civil Code, and the Defense of Trade Secrets Act at 18 U.S.C. § 1832(b), *et seq*.

16 64. The "MOVA Assets" at issue herein include the MOVA Contour technology, and

17 related hardware and software, source code, domestic and international patents and patent

18 applications, domestic and international trademarks, copyrights, trade secrets, domain names,

19 business records, and various related physical goods (the "MOVA Assets").

20 **C. Rearden's authorized use of the MOVA Contour system, methods, and Contour Program and output in fifteen major motion pictures and one videogame cinematic**

21 **trailer, and industry acclaim**

22 65. Rearden and its controlled companies operated the MOVA Contour system for, and

23 authorized used of its system, methods and Contour Program output by Universal Studios in *The*

24 *Incredible Hulk* (2008) and *Snow White and the Huntsman* (2012).

25 66. Rearden and its controlled companies operated the MOVA Contour system for, and

26 authorized used of its system, methods and Contour Program output by Sony Pictures in *The*

27 *Amazing Spider-Man* (2012).

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1   67.   Rearden and its controlled companies operated the MOVA Contour system for, and

2   authorized used of its system, methods and Contour Program output by Warner Brothers Studios in

3   *Harry Potter and the Deathly Hallows*, Part 1 (2010) and Part 2 (2011), *Green Lantern* (2011), *Jack*

4   *the Giant Slayer* (2013), and *Gravity* (2013).

5   68.   Rearden and its controlled companies operated the MOVA Contour system for, and

6   authorized used of its system, methods and Contour Program output by Disney Motion Pictures

7   Group in *TRON: Legacy* (2010), *Pirates of the Caribbean: On Stranger Tides* (2011), *John Carter*

8   (2012), and *The Avengers* (2012).

9   69.   Rearden and its controlled companies operated the MOVA Contour system for, and

10   authorized used of its system, methods and Contour Program output by Twentieth Century Fox in

11   *Percy Jackson and the Olympians: The Lightning Thief* (2010).

12   70.   Rearden and its controlled companies operated the MOVA Contour system for, and

13   authorized used of its system, methods and Contour Program output by Rocksteady Studios in the

14   videogame cinematic trailer, *Batman: Arkham City* (2011).

15   71.   And Rearden and its controlled companies operated the MOVA Contour system for,

16   and authorized used of its system, methods and Contour Program output by defendant Paramount

17   Pictures for "*The Curious Case of Benjamin Button*" (2008) and *Transformers: Dark of the Moon*

18   (2011).

19   72.   In each of the above fifteen films and one videogame cinematic trailer, the motion

20   picture and videogame studios performed a routine intellectual property due diligence prior to

21   contracting with Rearden for use of the MOVA Contour systems, methods, and Contour Program, in

22   part to verify that Rearden and its controlled companies owned the MOVA Contour Assets and

23   technology and was authorized to use them for the benefit of the studios.

24   73.   Rearden and Rearden-controlled companies have built considerable good will in the

25   MOVA Contour Assets and technology.   Rearden and Rearden-controlled companies used the

26   MOVA Contour systems and methods in the fifteen major motion pictures identified above, which

27   collectively grossed roughly $9.5 billion in global box office. Five of these movies are in the top-25

28   highest-grossing films since 2008 (when the first Contour movie was released), including the highest

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grossing film in each of 2011 and 2012[18]. The MOVA Contour system and methods and the Contour

Program output have been the subject of numerous film industry press articles in which luminaries

like director David Fincher have lauded the MOVA Contour technology:

> "Contour's promise is enormous," Fincher said. "The notion that the
> human face in all its subtleties could be mapped in real time and with
> such density of surface information opens up so many possibilities for
> both two- and three-dimensional image makers and storytellers."[19]

The MOVA Contour system and methods and the Contour Program output have been the subject of

an invited presentation by Steve Perlman to the Director's Guild of America[20], and they were

identified as a "breakthrough" in the aforementioned TED talk[21]. MOVA Contour facial capture's

improvements over prior facial performance capture technologies have been acclaimed by major

motion picture actors, producers, directors, and top VFX professionals, including Ed Ulbrich in his

TED Talk description of MOVA Contour and how it was essential in the creation of *The Curious

Case of Benjamin Button*.[22]. And on February 9, 2015, the Academy of Motion Picture Arts and

Sciences awarded the Scientific and Technical Award to the MOVA [Contour] facial performance

capture system.[23]

D.   Transfer of the MOVA Assets to OnLive, Inc., OL2, Inc., and Rearden Mova

74.   The MOVA Contour systems and methods, along with videogame streaming

technology, was spun out of Rearden in 2007 into OnLive, Inc., a corporation controlled by Rearden.

OnLive, Inc. thereafter owned all of the MOVA Assets, both Contour and other motion capture

technology.

75.   On August 17, 2012, OnLive, Inc. assigned all of its assets, including the MOVA

Assets, to OL2, Inc. as part of an assignment for the benefit of creditors ("ABC"). On information

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[18] www.boxofficemojo.com.

[19]Marlowe, July 31, 2006, op. cit.

[20] Directors Guild of America, July 28, 2007, op. cit.

[21] Op. cit.

[22] Ulbrich, Op. cit.

[23] http://oscar.go.com/news/oscar-news/150209-ampas-sci-tech-awards-2015-winners

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1   and belief, OL2, Inc. was primarily focused on the video gaming unit of OnLive, Inc., and was not

2   interested in offering any MOVA Contour movie production services.

3   76.   In October of 2012, Rearden learned that OL2, Inc. was interested in selling the

4   MOVA Assets, and ultimately decided to reacquire them. Rearden formed a wholly-owned

5   subsidiary, MO2 LLC, as a vehicle to acquire the MOVA Assets from OL2, Inc.

6   77.   Rearden's CEO Perlman tasked his employee Greg LaSalle with management of

7   MO2 LLC. LaSalle had worked with Rearden from 1999 to 2007, and between 2007 and August 17,

8   2012 worked for OnLive, Inc. LaSalle was rehired by Rearden LLC on August 20, 2012.

9   78.   On February 11, 2013, OL2, Inc. transferred the MOVA Assets to MO2 LLC through

10   a Membership Interest and Asset Purchase and Sale Agreement. MO2 LLC is wholly owned by

11   Rearden.

12   79.   On April 19, 2013, MO2 LLC transferred the MOVA Assets to another wholly-owned

13   Rearden company, Rearden Mova LLC.

14   80.   On September 18, 2014, Rearden recorded patent assignments for the MOVA Asset

15   patents, reflecting the assignment from OL2, Inc. LLC to MO2 LLC made in the Membership

16   Interest and Asset Purchase and Sale Agreement.

17   81.   Rearden also recorded patent assignments for the MOVA Asset patents, reflecting the

18   assignment from MO2 LLC to Rearden Mova on April 19, 2013. However, the execution dates of

19   the online forms were incorrectly filled in with the recordation dates of September18, 2014 (and in

20   one case, September 8, 2014). As soon as it became aware of the errors, Rearden corrected the

21   erroneous execution dates to the correct date: April 19, 2013.

22   **E.   Shenzhenshi's transparently false ownership claims**

23   82.   Unknown to Rearden, starting in October 2012, then-Rearden-employee LaSalle was

24   in negotiation with a company called Digital Domain 3.0, Inc. ("DD3"), a People's Republic of

25   China and India-owned Delaware Corporation doing business in Venice Beach, California under the

26   "DD3" or "Digital Domain" business names. DD3 is a successor company to prior Digital Domain

27   companies that Rearden, OnLive, Inc., and LaSalle (on behalf of Rearden and OnLive, Inc.) had

28   worked with previously in movie productions making authorized use of the MOVA technology

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1   identified above. DD3 is currently wholly-owned by Digital Domain Holdings Ltd. ("DDHL"), a

2   Hong Kong exchange-listed Bermuda corporation with its principal place of business in Hong Kong.

3   83.   On February 20, 2015, Shenzhenshi Haitiecheng Science and Technology Co., Ltd.

4   ("Shenzhenshi"), allegedly another People's Republic of China corporation with its purported

5   principal place of business in Shenzhen, China, filed a declaratory judgment action against Rearden

6   and various other Rearden entities in this judicial district, Case No. 3:15-cv-00797-JST, alleging that

7   it had acquired the MOVA Assets by assignment from MO2 LLC on May 8, 2013. Shenzhenshi

8   further alleged that it had granted an exclusive license to the MOVA Assets to DD3.

9   84.   But as set forth above, MO2 LLC did not own the MOVA Assets on May 8, 2013, so

10   it could not have assigned them to Shenzhenshi on that date. Rather, MO2 LLC had previously

11   assigned the MOVA Assets to Rearden Mova LLC on April 19, 2013. Further, on May 8, 2013

12   LaSalle was not a Rearden employee, and as an employee or not, LaSalle never had authority to sell

13   the MO2 LLC Assets to anyone. Nor could Shenzhenshi have granted a license of the MOVA Assets

14   to Digital Domain because it never owned the MOVA Assets. Shenzhenshi, DD3 and LaSalle knew

15   that the MO2-Shenzhenshi transaction was a ruse. LaSalle wrote to his attorneys, "[DD3] are going

16   to actually acquire the Mova assets through one of their Chinese companies [Shenzhenshi]. I believe

17   this is so it would be nearly impossible for Steve [Perlman] to go after them….They will indemnify

18   me against any claims brought by Rearden and Steve Perlman." [24]

19   85.   The day after the Court granted Rearden permission to file counterclaims, a company

20   called Virtue Global Holdings, Ltd., a British Virgin Islands corporation, suddenly appeared in the

21   Shenzhenshi case represented by Shenzhenshi's counsel. Shenzhenshi had absconded from the

22   litigation it instigated, and was found to be in default. Months later Virtue Global Holdings alleged

23   that Shenzhenshi had assigned the MOVA Assets to Virtue Global Holdings on December 17, 2015.

24   But again, as set forth above, Shenzhenshi never owned the MOVA Assets and therefore could not

25   have assigned them to Virtue Global Holdings.

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28   [24] *Shenzhenshi, et al. v. Rearden, et al.,* NDCA Case No. 15-797, HEYL001594.

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86.   Rearden asserted counterclaims for declaratory relief against Shenzhenshi and Virtue Global Holdings affirming Rearden's ownership of the MOVA Assets, and for patent, trademark, and copyright infringement, misappropriation of trade secrets, fraudulent transfer, and other causes of action.

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87.   The MOVA Asset ownership and fraudulent transfer claims were bifurcated and tried in December, 2016. A ruling is pending.

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F.   Defendant's unauthorized use of the MOVA Contour system, methods, and Contour Program and output

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88.   Once LaSalle was hired by DD3 in or about May, 2013, DD3 took possession of the MOVA Contour physical apparatus for Shenzhenshi. On information and belief, LaSalle had access to the secure storage facility where the physical MOVA Contour apparatus was kept, and assisted DD3 in taking unauthorized possession of the patented MOVA Contour apparatus and copies of the copyrighted Contour Program.

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89.   Thereafter, DD3 began secretly offering MOVA Contour facial performance capture services and Contour Program output to motion picture studios and production companies, including defendants. The system used by DD3 is the very *same system* developed and constructed by Rearden and stolen from the secure storage facility, which includes commercial embodiments of the system claims in the MOVA patents. And statements by Sheldon Stopsack, *Terminator: Genisys* VFX Supervisor[25] and associated video[26] confirm that DD3 performed the very *same methods* that are commercial embodiments of the method claims of the MOVA patents.

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90.   Despite the fact that defendant Paramount had previously made movies based on authorized use of MOVA Contour from Rearden and Rearden-controlled companies, and despite the fact that *Terminator: Genisys* used MOVA Contour technology while Rearden was in the well-publicized *Shenzhenshi* litigation regarding MOVA Contour's ownership, Paramount nonetheless secretly contracted, either directly or in concert with entities subject to its supervision and control, for use of the MOVA Contour system, methods, and Contour Program and output in at least

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[25] Frei, Vincent, op. cit.

[26] Seymour, Mike, op. cit.

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1   *Terminator: Genisys* without ever contacting Rearden or Mr. Perlman to confirm that it was

2   authorized to do so.

3   91.   *Terminator: Genisys* was reproduced and distributed for performance and display in

4   theaters in the United States by defendant Paramount, and produced directly by Paramount or in

5   concert with entities subject to its supervision and control. Paramount Home Entertainment

6   reproduced and distributed *Terminator: Genisys* on DVD, Blu-ray, digital download and streaming,

7   and other media for performance and display by consumers in the United States.

8   92.   On information and belief, between February 2013 and June 22, 2015, Paramount,

9   either directly or in concert with an entity subject to its supervision and control, contracted with DD3

10   to provide facial performance capture services using the copyrighted Contour Program and output,

11   including, at least the performance of Arnold Schwarzenegger for the CG face of the age-37

12   Terminator character in *Terminator: Genisys*. DD3 provided such facial performance capture

13   services and Contour Program output subject to the terms of its contract and the supervision and

14   control of defendant Paramount. Paramount incorporated the Contour Program output of the

15   copyrighted Contour Program into derivative works that were reproduced, distributed, displayed and

16   performed in *Terminator: Genisys,* without authorization.

17   93.   Defendant Paramount knew or should have known that the copyrighted Contour

18   Program and output were owned by Rearden and other Rearden-controlled companies because:

19   ▪   Paramount had previously contracted with Rearden and its controlled companies to provide

20   authorized facial performance capture services and Contour Program output for use in *The*

21   *Curious Case of Benjamin Button*" (2008), a movie that won an Academy Award for

22   ground-breaking reverse-aging of Brad Pitt's CG face based on MOVA Contour technology

23   and *Transformers: Dark of the Moon* (2011), which became the 4th highest grossing movie

24   of all time.

25   ▪   Paramount had previously conducted due diligence to confirm Rearden and its controlled

26   companies' ownership of MOVA Contour technology. Paramount conducted, or should have

27   conducted, due diligence to verify that DD3 was authorized to offer the MOVA Contour

28   facial performance capture services and Contour Program output.

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94.   Neither Rearden nor Rearden Mova were aware of—let alone authorized use of—the copyrighted MOVA Contour Program and output by DD3, Paramount, or Paramount Home Entertainment in *Terminator: Genisys*. Nor did Rearden or Rearden Mova authorize any reproduction, distribution, performance, or display of the copyrighted Contour Program's output or the creation of derivative works based upon those output by DD3, Paramount, or Paramount Home Entertainment in *Terminator: Genisys*. At no time did DD3 or defendant Paramount negotiate or come to agreement on financial terms in which Rearden would authorize MOVA Contour facial performance capture services and Contour Program output to be used in *Terminator: Genisys*.

95.   Sheldon Stopsack, *Terminator: Genisys* VFX Supervisor stated how MOVA Contour captured the subtle facial motions required for a believable Schwarzenegger age-37 CG face:

> "It is already difficult enough… to create a human being digitally. It becomes even more difficult if that human being is … such an iconic figure as Arnold Schwarzenegger."[27]

> "…we had the opportunity to do a MOVA performance capture with Arnold Schwarzenegger himself… This gave us a basis of very subtle movements."[28]

96.   The photograph below[29] shows Contour Program output stills from MOVA Contour systems and methods facial capture of Mr. Schwarzenegger used to create the derivative age-37 CG face. **Left:** Age-67 Skin Texture, labeled "MOVA Video" by Paramount. **Middle:** Age-67 Tracking Mesh, labeled "MOVA raw" by Paramount. **Right:** Age-67 Tracking Mesh retargeted to a derivative age-37 CG face model, labeled "MOVA retarget" by Paramount:

[27] "Upgrades: VFX of Terminator Genisys", op. cit.

[28] Frei, Vincent, op. cit.

[29] Seymour, Mike, "Terminator Genisys: Creating a Fully Digital Schwarzenegger," July 17, 2015. Wired. https://youtu.be/DKlbaU_uWpI

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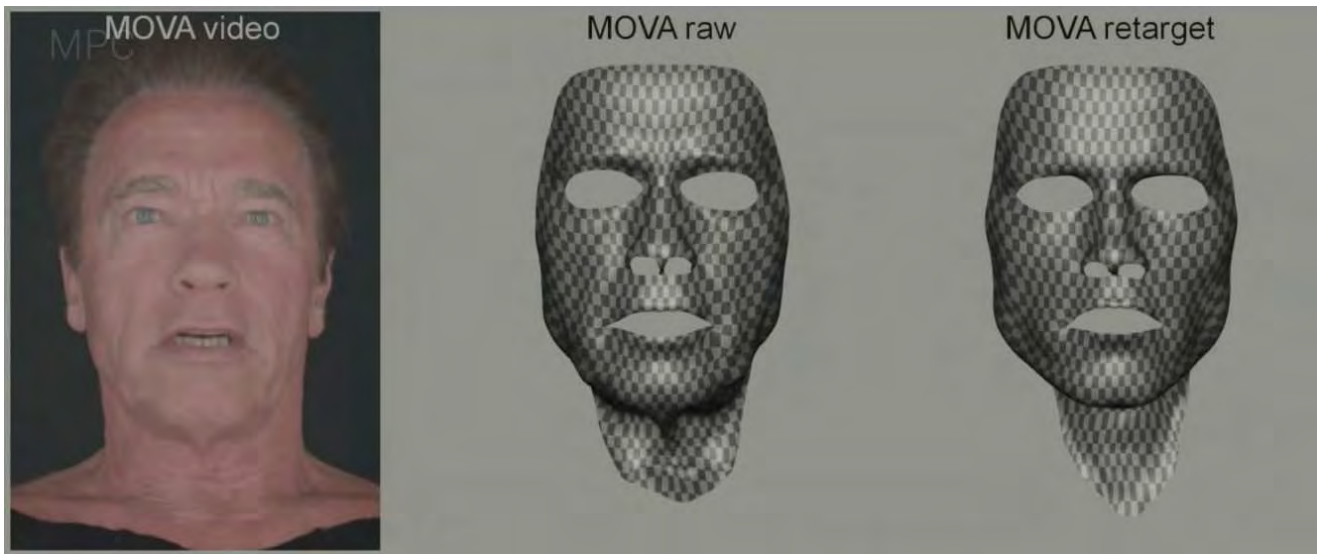
97.   The below photograph is a still from the *Terminator: Genisys* Blu-ray featurette[30]
showing how Paramount created the age-37 CG face. On the left is the MOVA Contour Program's
Skin Texture output showing Mr. Schwarzenegger's age-67 facial performance. On the right is the
Contour Program output derivative age-37 CG face:

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[30] "Upgrades: VFX of Terminator Genisys", op. cit.

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98.   The below photograph shows a still of the Contour Program output derivative age-37 CG face from a scene in the *Terminator: Genisys* film:

99.   The below photograph shows a still of the Contour Program output derivative Schwarzenegger age-37 CG face from *Terminator: Genisys* alongside the live action face of age-67 Mr. Schwarzenegger:

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100.   The below photographs show stills of the Contour Program output derivative Schwarzenegger age-37 CG face from a scene in the *Terminator: Genisys* film alongside the live action age-67 Mr. Schwarzenegger. The age-37 CG character is shown in wireframe on top, and rendered below:

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101.   Before, during, and after the theatrical release, Paramount repeatedly promoted the *Terminator: Genisys* film with trailers[31] and social media postings of the fight between the live action current age-67 Arnold Schwarzenegger Terminator and the CG age-37 Schwarzenegger Terminator, calling it "A battle for the ages...Arnold vs. Arnold…[32]". Below is a screenshot of such a promotion on Paramount's *Terminator: Genisys* Facebook page, posted prior to the film's U.S. release:
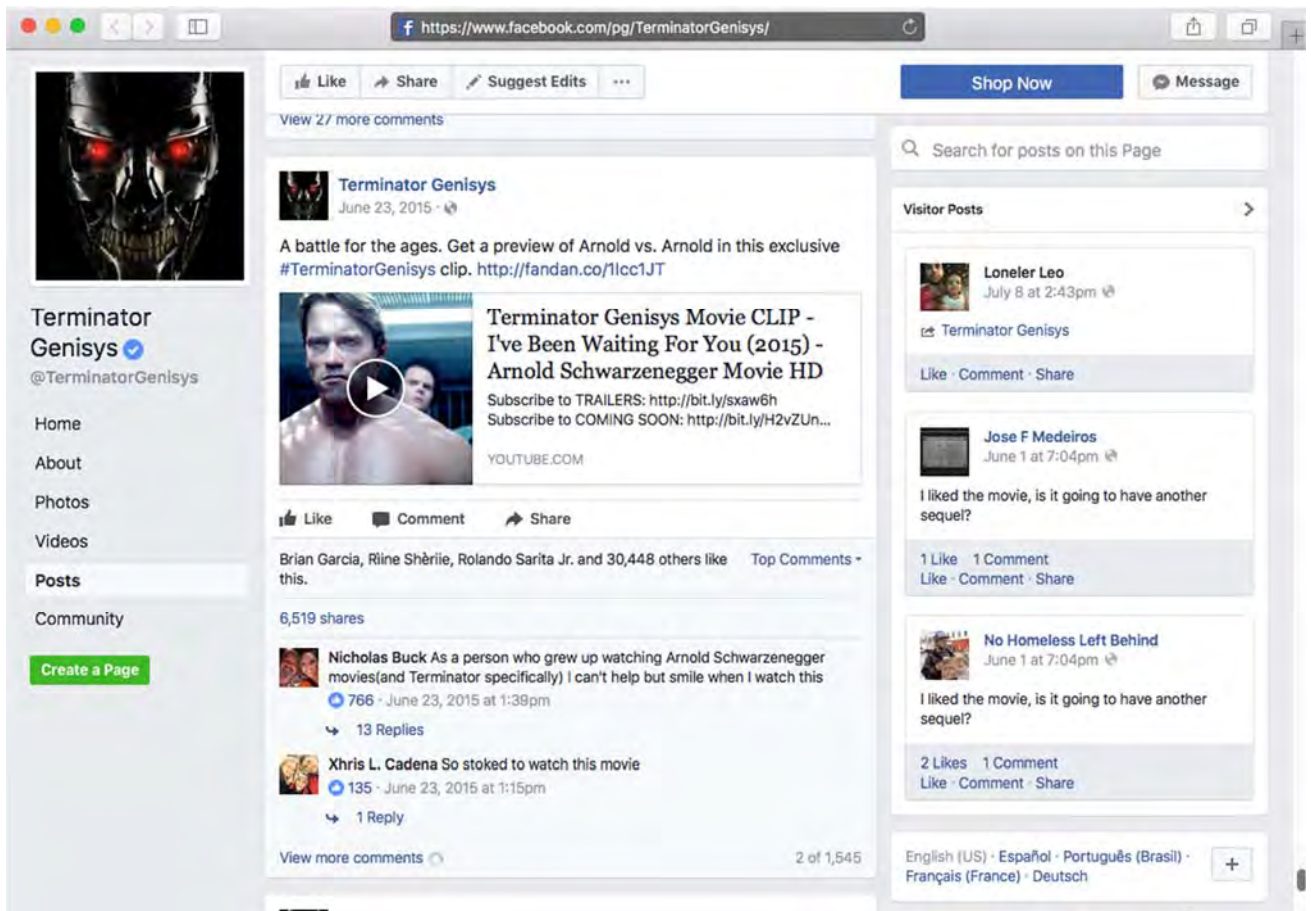
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[31] E.g., Trailer #1, Dec. 4, 2014: https://www.youtube.com/watch?v=FqbOFjl7ZWE ; Trailer #2, Apr. 13, 2015 https://www.youtube.com/watch?v=jNU_jrPxs-0, and numerous other videos.

[32] "A battle for the ages. Get a preview of Arnold vs. Arnold in this exclusive #TerminatorGenisys clip. http://fandan.co/1Icc1JT", June 23, 2015. Paramount Terminator: Genisys Facebook promotional page. https://www.facebook.com/TerminatorGenisys/

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102.   Defendant Paramount released *Terminator: Genisys* in domestic theaters on or about July 1, 2015, grossing $89 million domestically and $441 million globally.

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103.   Defendant Paramount Home Entertainment released *Terminator: Genisys* on DVD and Blu-ray, and via digital distribution such as download and streaming services on or about October 20, 2015. Paramount has earned over $25 million on DVD, Blu-ray, and digital distribution as of the date of this complaint. Paramount also distributed *Terminator: Genisys* across a wide range of other distribution means, such as on airplanes, in hotels, through cable and satellite television services, *etc*.

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FIRST CAUSE OF ACTION:
COPYRIGHT INFRINGEMENT

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104.   Plaintiffs reallege and incorporate each and every allegation contained in the paragraphs above with the same force and effect as if said allegations were fully set forth herein.

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105.   At all material times, plaintiff Rearden Mova was and is the owner of United States Copyright Registration No. TXu001977151for the MOVA Contour computer program ("Contour Program").

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106.   The authors of the Contour Program created programming that performs several operations. Some of the Contour Program controls the Contour apparatus, including processing images from the two pluralities of Contour cameras. Some of the Contour Program operates prior to a facial capture session to prepare and calibrate the Contour system, some of the Contour Program operates in real-time during a live facial capture, and some of the Contour Program operates after the facial capture. The Contour Program produces several types of output, some of which are used by the Contour Program itself for further processing, and some of which are used for driving a CG face in a movie or videogame. The Contour Program output includes:

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(a) the output of the first plurality of cameras called herein the "**Skin Texture**". Displayed, this output looks like normal skin and facial features of the performer from multiple angles, largely without visible makeup.

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(b) the output of the second plurality of cameras called herein the "**Makeup Pattern**". Displayed, this output looks like a random pattern of green or blue largely without showing the performer's skin or other facial features (e.g. eyes or mouth).

(c) the Contour Program uses the Makeup Pattern output to compute a high-resolution 3D surface that moves in the shape of the performer's skin with sub-millimeter precision. This output is called herein the "**Captured Surface**" and, rendered on a display, it looks like a 3D bust of the performer's skin in motion.

(d) the Contour Program uses the Makeup Pattern output to compute a high-resolution 3D mesh that tracks 3D points on the skin of the performer, as the skin moves from frame-to-frame. This output is called herein the "**Tracking Mesh**" and, rendered on a display, it looks like a 3D mesh that exactly follows the movement, stretching and wrinkling the skin as the performer moves their face. The Tracking Mesh tracks the subtleties of the performer's facial motion with sub-millimeter precision.

(e) the Contour Program produces other output associated with the facial motion capture session, for example, timing files that can be used to synchronize an audio recording of the performer with facial capture of the performer.

107.   All of Contour Program output, including Skin Texture, Makeup Pattern, Captured Surface, and Tracking Mesh output, were fixed in a tangible medium of expression when their embodiments were stored in non-volatile computer memory and/or media such as CD, CD-R, DVD or Blu-ray disks from which they may be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.

108.   The Contour Program performs substantially all of the operations required to produce the Contour Program output, including Skin Texture, Makeup Pattern, Captured Surface, and Tracking Mesh output. Given identical facial motion capture inputs, the Contour Program will produce identical output. Accordingly, the authors of the Contour Program are the authors of the Contour Program output, and the Contour Program output is subject to the copyright in the Contour Program owned by Rearden Mova.

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109.   It follows that at all material times plaintiff Rearden Mova owned the exclusive right to reproduce, distribute copies of, perform, and display the Contour Program output including Skin Texture, Makeup Pattern, Captured Surface, and Tracking Mesh output; to make derivative works based upon Contour Program Skin Texture, Makeup Pattern, Captured Surface and Tracking Mesh output; and to reproduce, distribute, perform, and display the derivative works.

110.   At all material times, defendant Paramount had the right and ability to supervise and control the infringing conduct alleged herein, including but not limited to all infringing acts of DD3 and other entities subject to Paramount's supervision and control, and had an obvious and direct financial interest in the exploitation of Rearden Mova's copyrighted works.

111.   Defendant Paramount, either directly or in concert with an entity subject to its supervision and control, contracted with DD3 to produce Contour Program output including Skin Texture, Makeup Pattern, Captured Surface and Tracking Mesh output, using the MOVA Contour Program for Paramount's financial benefit in the production of the feature film *Terminator: Genisys*.

112.   Defendant Paramount, either directly or in concert with an entity subject to its supervision and control, prepared at least one CG character whose face was derived from some or all of the Contour Program output including the Skin Texture, Makeup Pattern, Captured Surface, and Tracking Mesh output, for insertion into its motion pictures, including but not limited to the age 37 Schwarzenegger CG Terminator character in *Terminator: Genisys*. This CG character was and is an original "audiovisual work" within the meaning of 17 U.S.C. § 101, which was fixed in a tangible medium of expression when its embodiments were stored in non-volatile computer memory and/or media such as CD, CD-R, DVD or Blu-ray disks from which it may be perceived, reproduced, or otherwise communicated for a period of more than transitory duration. This CG character incorporates some or all of the Contour Program output including Skin Texture, Makeup Pattern, Captured Surface, and Tracking Mesh output in their entireties, and the Contour Program output is wholly and indivisibly merged in the derivative CG character.

113.   Consequently, the CG character prepared by Paramount, either directly or in concert with an entity subject to its supervision and control, which was derivative of Contour Program output including some or all of the Skin Texture, Makeup Pattern, Captured Surface, and Tracking Mesh

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1   output, constitutes a "derivative work" as that term is defined in 17 U.S.C. § 101 prepared in

2   violation of Rearden Mova's exclusive rights under 17 U.S.C. § 106 (2).

3   114.   On information and belief, while preparing derivative works based on some or all of

4   the Contour Program output including Skin Texture, Makeup Pattern, Captured Surface, and

5   Tracking Mesh output, for the feature film *Terminator: Genisys,* Paramount, either directly or in

6   concert with an entity subject to its supervision and control, reproduced, distributed, performed.

7   and/or displayed copies of some or all of the Contour Program output including Skin Texture,

8   Makeup Pattern, Captured Surface, and Tracking Mesh output, in violation of Rearden Mova's

9   exclusive rights under 17 U.S.C. § 106 (1), (3), (4) and (5).

10   115.   Paramount reproduced the finished *Terminator: Genisys* film containing CG character

11   derivative works prepared based on some or all of the Contour Program output including Skin

12   Texture, Makeup Pattern, Captured Surface, and Tracking Mesh output, and distributed the films on

13   hard drives, by digital satellite transmission, and/or via other media, and authorized their

14   performance and display in motion picture theaters throughout the United States in violation of

15   Rearden Mova's exclusive rights under 17 U.S.C. § 106(1), (3), (4) and (5).

16   116.   Paramount and its wholly-owned and controlled subsidiary Paramount Home

17   Entertainment, either directly or in concert with entities subject to their supervision and control,

18   reproduced the finished *Terminator: Genisys* films containing derivative works prepared based on

19   some or all of the Contour Program output including Skin Texture, Makeup Pattern, Captured

20   Surface, and Tracking Mesh output, distributed the film on DVDs and Blu-rays, digital download

21   and streaming, and other media, and authorized their performance and display by consumers

22   throughout the United States in violation of Rearden Mova's exclusive rights under 17 U.S.C. §

23   106(1), (3), (4) and (5).

24   117.   Neither defendant Paramount nor Paramount Home Entertainment, nor any other

25   entities with which Paramount and Paramount Home Entertainment acted in concert and subject to

26   their supervision and control, including but not limited to DD3, sought or received authorization

27   from plaintiffs to use the copyrighted Contour Program and output including Skin Texture, Makeup

28   Pattern, Captured Surface and Tracking Mesh output, to prepare derivative works to be used in the

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feature film *Terminator: Genisys*, or to reproduce, distribute, perform or display such derivative works.

118.   The acts of infringement by Paramount and Paramount Home Entertainment, either directly or in concert with entities subject to their supervision and control, were and are willful, intentional, purposeful and knowing, in that Paramount and Paramount Home Entertainment, either directly or in concert with entities subject to their supervision and control, at all material times had actual knowledge that the copyright in the Contour Program and output has been and is owned by Rearden Mova as successor-in-interest to its original author and claimant, or was in reckless disregard of or willful blindness to Rearden Mova's copyright. Paramount and Paramount Home Entertainment, either directly or in concert with entities subject to their supervision and control, have acted and continue to act in knowing disregard of and indifference to the rights of Plaintiffs.

119.   Paramount and Paramount Home Entertainment are liable for each act of direct and actively induced copyright infringement alleged above because they had actual knowledge of the acts of infringement, personally and actively directed and participated in such acts of infringement, and financially benefitted from such acts of infringement.

120.   Plaintiffs have been harmed as the direct and proximate result of the foregoing acts of copyright infringement, including both financial and irreparable harm that has no adequate remedy at law. Plaintiffs are entitled to injunctive relief, actual damages, profits of the infringer, and all such other remedies as may be available under the Copyright Act.

**SECOND CAUSE OF ACTION:
TRADEMARK INFRINGEMENT**

121.   Plaintiffs reallege and incorporate each and every allegation contained in the paragraphs above with the same force and effect as if said allegations were fully set forth herein.

122.   At all material times, plaintiff Rearden Mova was the owner of U.S. Registration No. 3,843,152 for the MOVA service mark.

123.   MOVA is an arbitrary or at least fanciful mark that is inherently distinctive.

124.   Since at least 2006, Rearden Mova and its predecessors-in-interest have used the MOVA service mark in connection with the marketing, promotion, and sales of facial performance

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1   capture services and output to the motion picture and videogame industry, including major motion

2   picture studios and VFX studios.

3   125.   Through the marketing, promotion, and sales efforts of Rearden Mova and its

4   predecessors-in-interest from 2005 through the present, and through the widespread publicity of and

5   industry acclaim for the MOVA Contour facial performance capture technology and services offered

6   by Rearden, Rearden Mova's MOVA service mark has acquired secondary meaning indicating that

7   Rearden is the exclusive origin of the MOVA Contour facial performance capture technology and

8   services.

9   126.   Without authorization, Paramount and Paramount Home Entertainment, acting either

10   directly or in concert with entities subject to their supervision and control, used Rearden's MOVA

11   service mark in commerce in connection with commercial advertising and promotion of their

12   *Terminator: Genisys* film, including at least promotional materials provided to the press for videos

13   including "Terminator Genisys: Creating a Fully Digital Schwarzenegger"[33], in press interviews

14   including, "Terminator Genisys: Sheldon Stopsack—VFX Supervisor—MPC,"[34] and through

15   Paramount's posts on its *Terminator: Genisys* promotional social media pages, including

16   https://www.facebook.com/TerminatorGenisys/[35].

17   127.   Paramount and Paramount Home Entertainment's unauthorized use of Rearden

18   Mova's MOVA service mark in the promotional materials, press interviews and social media posts

19   for *Terminator: Genisys* is a use of a word or term that is likely to cause confusion, mistake or

20   deception as to the affiliation, connection, or association of Paramount and Paramount Home

21   Entertainment with Rearden, and/or as to the origin, sponsorship, or approval of the facial motion

22   capture services used in the *Terminator: Genisys* film by Rearden because the MOVA service mark

23   is exclusively associated with Rearden and its MOVA Contour facial motion capture services.

24   128.   Paramount and Paramount Home Entertainment's unauthorized use of Rearden

25   Mova's MOVA service mark in promotional materials, press interviews and social media posts for

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[33] Seymour, Mike, op. cit.

27   [34] Frei, Vincent, op. cit.

[35] Paramount Terminator: Genisys Facebook promotional page, op. cit.

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1   their *Terminator: Genisys* film is a misleading description or representation of fact that is likely to

2   cause confusion, mistake, or deception as to the affiliation, connection, or association of Paramount

3   and Paramount Home Entertainment with Rearden, and/or as to the origin, sponsorship, or approval

4   of the facial motion capture services used in the *Terminator: Genisys* film by Rearden because the

5   MOVA service mark is exclusively associated with Rearden and its MOVA Contour facial motion

6   capture services.

7   129.   Unauthorized use in commerce of Rearden Mova's MOVA service mark by

8   Paramount and Paramount Home Entertainment, acting either directly or in concert with entities

9   subject to their supervision and control, in connection with commercial advertising and promotion of

10 their *Terminator: Genisys* film, including press releases, press conferences, and other advertising and

11 promotional activities, constitutes a use of a word or term and a misleading description or

12 representation of fact that is likely to cause confusion, mistake or deception as to the characteristics

13 and qualities of the facial motion capture services in the film because the MOVA service mark is

14 exclusively associated with Rearden and its MOVA Contour facial motion capture services.

15   130.   Plaintiffs are, and are likely to continue to be, damaged by Paramount and Paramount

16 Home Entertainment's unauthorized use of its Rearden MOVA service mark.

17   131.   Paramount and Paramount Home Entertainment's unauthorized use of Rearden

18 Mova's MOVA service mark in commerce was with actual knowledge or willful disregard of

19 Rearden Mova's service mark, with intent to cause confusion, mistake or deception.

20   132.   Paramount and Paramount Home Entertainment are liable to Plaintiffs for each and

21 every act of trademark infringement alleged herein.

22   133.   Plaintiffs are entitled to an award of their actual damages, disgorgement of defendant

23 Paramount and Paramount Home Entertainment's profits, and costs and attorney's fees.

24   134.   Furthermore, Plaintiffs have suffered irreparable harm that is not compensable by

25 monetary damages, and is therefore entitled to injunctive and other equitable relief.

PRAYER FOR RELIEF

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27   Wherefore, Plaintiffs request the following relief:

28   A.   Enter preliminary and/or permanent injunctions as follows:

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1   1.   Pursuant to 17 U.S.C. § 502, enter an injunction prohibiting Paramount and

2   Paramount Home Entertainment from reproducing, distributing, performing or displaying, or

3   authorizing the same, the *Terminator: Genisys* motion picture in any medium without

4   authorization of Plaintiffs.

5   2.   Pursuant to 15 U.S.C. § 1116, enter an injunction prohibiting Paramount and

6   Paramount Home Entertainment from using any of Plaintiffs' trademarks and service marks,

7   and prohibiting distribution of the *Terminator: Genisys* motion picture in any medium

8   bearing any of Plaintiffs' trademarks and service marks without authorization of Plaintiffs.

9   B.   Pursuant to 17 U.S.C. § 503 and 15 U.S.C. § 1118, order the impoundment and

10   destruction of all infringing copies of *Terminator: Genisys* motion picture in any medium.

11   C.   Award financial damages compensation as follows:

12   1.   Pursuant to 17 U.S.C. § 504, award Plaintiffs (a) actual damages; and (b) any

13   additional profits of Paramount and Paramount Home Entertainment that are attributable to

14   the copyright infringements alleged herein and are not taken into account in computing the

15   actual damages.

16   2.   Pursuant to 17 U.S.C. § 1117, award Plaintiffs (a) Paramount and Paramount

17   Home Entertainment's profits; (b) damages sustained by Plaintiffs in an amount to be proved

18   at trial; and (c) the costs of this action.

19   D.   Willful Infringement.

20   Pursuant to 17 U.S.C. § 1117, enter a finding that Paramount and Paramount Home

21   Entertainment's trademark infringements as alleged herein were willful, in reckless disregard,

22   or in willful blindness to Plaintiffs' trademark rights, and order enhanced damages, costs, and

23   attorney's fees.

24   E.   Award Plaintiffs their costs and attorney's fees as follows:

25   1.   Pursuant to 17 U.S.C. § 505, award full costs and a reasonable attorney's fee

26   to Plaintiffs.

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1   2.   Pursuant to 15 U.S.C. § 1117, enter a finding that Paramount and Paramount

Home Entertainment's trademark infringements as alleged herein present an exceptional case, and

award Plaintiffs their costs and attorney's fees.

        F.   Grant such other and further relief as the Court deems just and equitable.

<div align="center">

DEMAND FOR JURY TRIAL

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        Pursuant to Fed. R. Civ. P. 38(b), plaintiff demands trial by jury of all issues so triable under

the law.

DATED: July 24, 2017   HAGENS BERMAN SOBOL SHAPIRO LLP

                     By */s/ Rio S. Pierce*
                        Rio S. Pierce

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                     Mark S. Carlson (*pro hac vice* pending)
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                     Attorneys for Plaintiffs
                     Rearden LLC and Rearden Mova LLC

Exhibit 1

Certificate of Registration

This Certificate issued under the seal of the Copyright
Office in accordance with title 17, *United States Code,*
attests that registration has been made for the work
identified below. The information on this certificate has
been made a part of the Copyright Office records.

Maria A. Pallante

United States Register of Copyrights and Director

Registration Number

TXu 1-977-151

Effective Date of Registration:
February 11, 2016

Title

Title of Work:	MOVA Contour

Completion/Publication

Year of Completion:	2009

Author

Author:	OnLive, Inc.
Author Created:	computer program
Work made for hire:	Yes
Citizen of:	United States

Copyright Claimant

Copyright Claimant:	Rearden Mova LLC
	355 Bryant Street, Suite 110, San Francisco, CA, 94107, United States
Transfer statement:	By written agreement

Rights and Permissions

Organization Name:	Law Offices of Jonathan Kirsch
Name:	Jonathan Kirsch
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Telephone:	(310)785-1200
Address:	1880 Century Park East
	Suite 515
	Los Angeles, CA 90067 United States

Certification

Name:	Jonathan Kirsch
Date:	February 11, 2016
Applicant's Tracking Number:	2347.3.4

Correspondence: Yes

Exhibit 2

United States of America

United States Patent and Trademark Office

MOVA

Reg. No. 3,843,152
Registered Aug. 31, 2010

MOVA, LLC (CALIFORNIA LIMITED LIABILITY COMPANY)
181 LYTTON AVENUE
PALO ALTO, CA 94301

Int. Cl.: 42

FOR: RENTAL OF COMPUTER HARDWARE AND SOFTWARE FOR USE IN THE FIELD
OF ENTERTAINMENT, IN CLASS 42 (U.S. CLS. 100 AND 101).

SERVICE MARK

FIRST USE 9-1-2009; IN COMMERCE 9-1-2009.

PRINCIPAL REGISTER

THE MARK CONSISTS OF STANDARD CHARACTERS WITHOUT CLAIM TO ANY PAR-
TICULAR FONT, STYLE, SIZE, OR COLOR.

THE FOREIGN WORDING IN THE MARK TRANSLATES INTO ENGLISH AS IT MOVES.

SN 78-599,227, FILED 3-31-2005.

LANA PHAM, EXAMINING ATTORNEY

Director of the United States Patent and Trademark Office

Exhibit 3

Int. Cl.: 41

Prior U.S. Cls.: 100, 101, and 107

Reg. No. 3,628,974

United States Patent and Trademark Office   Registered May 26, 2009

SERVICE MARK
PRINCIPAL REGISTER

CONTOUR

MOVA, LLC (CALIFORNIA LIMITED LIABILITY COMPANY)
181 LYTTON STREET
PALO ALTO, CA 94301

FOR: VISUAL EFFECTS AND MOTION PICTURE PRODUCTION SERVICES, ALL IN THE FIELD OF ENTERTAINMENT; ENTERTAINMENT SERVICES, NAMELY, SPECIAL EFFECTS, VISUAL EFFECTS AND ANIMATION SERVICES FEATURING MOTION CAPTURE FOR TRANSLATING MOVEMENT OF A REAL SUBJECT AND MAPPING SUCH MOVEMENT ONTO A 3-DIMENSIONAL COMPUTER-GENERATED MODEL OR AS A COMPUTER-GEN-ERATED SUBJECT, IN CLASS 41 (U.S. CLS. 100, 101 AND 107).

FIRST USE 8-1-2006; IN COMMERCE 7-25-2007.

THE MARK CONSISTS OF STANDARD CHARACTERS WITHOUT CLAIM TO ANY PARTICULAR FONT, STYLE, SIZE, OR COLOR.

SN 78-981,021, FILED 5-4-2006.

DANIEL CAPSHAW, EXAMINING ATTORNEY