

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
WASHINGTON, D.C.**

**Before The Honorable Doris Johnson Hines  
Administrative Law Judge**

**In The Matter Of**

**CERTAIN SMART WEARABLE DEVICES,  
SYSTEMS, AND COMPONENTS THEREOF**

**Investigation No. 337-TA-1398**

**RESPONDENTS' NOTICE OF PRIOR ART**

Pursuant to Order Nos. 2 (April 17, 2024) and 9 (May 15, 2024), Respondents RingConn LLC and Shenzhen Ninenovo Technology Limited (collectively, “RingConn”) and Respondents Ultrahuman Healthcare Pvt. Ltd., Ultrahuman Healthcare Ltd., and Ultrahuman Healthcare SP, LLC (collectively, “Ultrahuman”) hereby gives their notice of prior art. In addition to the references provided in the tables below, Respondents may rely upon prior art: (i) listed on the patents-in-suit or contained within the prosecution histories, (ii) contained within the prosecution histories of patents or patent applications related to the asserted patents; (iii) identified by one or more of the parties in a notice of prior art, (iv) prior art identified in Respondents’ invalidity contentions, (v) identified during discovery of this Investigation; (vi) offered by one or more of the parties into evidence at the hearing; (vii) listed on the patents listed on one or more of the tables below or in the prosecution histories of the patents listed below. With respect to the foregoing prior art references, Respondents also reserve the right to rely on any prior invention and commercial embodiments that a reasonable opportunity for discovery shows are prior art under 35 U.S.C. § 102 as anticipatory prior art, as rendering any asserted missing element obvious, or as evidence of the ordinary level of skill in the art. Respondents further reserve the right to rely on technical

dictionaries and treatises as rendering any asserted missing element inherent, obvious, or as evidence of the ordinary level of skill in the art.

Respondents reserve the right to supplement or amend this Notice to address any new or modified infringement contentions asserted by Complainants, to rebut any contentions regarding the prior art or Respondents' invalidity or unenforceability positions, or to the extent that additional prior art is identified during the course of this Investigation.

To the extent not listed herein, Respondents incorporate by reference all prior art cited in the Commission Investigative Staff's Notice of Prior Art.

Country	Patent or Publication No.	Title	Date of Publication or Issue
France	FR 2767384 to Chen	Finger Temperature Indicator For Indicating Physical And Mentally Relaxed State	1999-02-19
Germany	DE 102013012339 to Shröder	External Secure Unit	2015-01-29
Japan	JP 2007/222276A to Sasaki	Health Management System	2007-09-06
United States	U.S. Prov. 61/768,279 to Mestas	Activity Monitoring, Tracking And Synchronization	2013-02-22
Europe	EP 2,413,263 to Antequera Diaz	3d Biometric Scanner	2012-02-01
Europe	EP 2,974,650 to Zhang	Wearable Device And Method For Manufacturing The Same	2016-01-20
United States	U.S. 5,333,616 to Mills	Wrist-Worn Ecg Monitor	1994-08-02
United States	U.S. 5,964,701 to Asada	Patient Monitoring Finger Ring Sensor	1999-10-12
United States	U.S. 6,236,037 to Asada	Finger Touch Sensors And Virtual Switch Panels	2001-05-22
United States	U.S. 6,402,690 to Rhee	Isolating Ring Sensor Design	2002-06-11
United States	U.S. 6,922,592 to Thomson	Implantable Medical Device Controlled By A Non-Invasive Physiological Data Measurement Device	2005-07-26
United States	U.S. 7,238,159 to Banet	Device, System And Method For Monitoring Vital Signs	2007-07-03
United States	U.S. 7,548,040 to Lee	Wireless Battery Charging Of Electronic Devices Such As Wireless Headsets/Headphones	2009-06-16

United States	U.S. 7,641,614 to Asada	Wearable Blood Pressure Sensor And Method Of Calibration	2010-01-05
United States	U.S. 7,674,231 to McCombie	Wearable Pulse Wave Velocity Blood Pressure Sensor And Methods Of Calibration Thereof	2010-03-09
United States	U.S. 8,251,903 to LeBoeuf	Noninvasive Physiological Analysis Using Excitation-Sensor Modules And Related Devices And Methods	2012-08-28
United States	U.S. 8,398,546 to Pacione	System For Monitoring And Managing Body Weight And Other Physiological Conditions Including Iterative And Personalized Planning, Intervention And Reporting Capability	2013-03-19
United States	U.S. 8,568,330 to Mollicone	Composite Human Physiological Stress Index Based On Heart Beat And Sleep And/Or Activity History Data Including Actigraphy	2013-10-29
United States	U.S. 8,588,032 to Geyer	Electronically Controlled Watch	2013-11-19
United States	U.S. 8,602,988 to Hunt	Recovery Determination Methods And Recovery Determination Apparatuses	2013-12-10
United States	U.S. 8,682,421 to Riftine	Fitness Score Assessment Based On Heart Rate Variability Analysis During Orthostatic Intervention	2014-03-25
United States	U.S. 8,700,111 to LeBoeuf	Light-Guiding Devices And Monitoring Devices Incorporating Same	2014-04-15
United States	U.S. 8,715,204 to Webster	Wireless Vaginal Sensor Probe	2014-05-06
United States	U.S. 8,717,165 to Bernandt	Apparatus And Method For Locating, Tracking, Controlling And Recognizing Tagged Objects Using Rfid Technology	2014-05-06
United States	U.S. 8,795,184 to Niwa	Wireless Plethysmogram Sensor Unit, A Processing Unit For Plethysmogram And A Plethysmogram System	2014-08-05

United States	U.S. 8,936,552 to Kateraas	Physical Activity Monitor And Data Collection Unit	2015-01-20
United States	U.S. 8,954,135 to Yuen	Portable Biometric Monitoring Devices And Methods Of Operating Same	2015-02-10
United States	U.S. 8,961,414 to Teller	Apparatus For Monitoring Health, Wellness And Fitness	2015-02-24
United States	U.S. 8,974,349 to Weast	Wearable Device Assembly Having Athletic Functionality	2015-03-10
United States	U.S. 9,202,111 to Arnold	Fitness Monitoring Device With User Engagement Metric Functionality	2015-12-01
United States	U.S. 9,519,755 to Saalasti	Method And System For Evaluating A Physiological State Depicting A Person's Resources	2016-12-13
United States	U.S. 9,563,234 to Popalis	Modular Wearable Computing Device	2017-02-07
United States	U.S. 9,568,492 to Yuen	Fitness Monitoring Device With Altimeter And Gesture Recognition	2017-02-14
United States	U.S. 9,594,404 to Yoon	Body-Wearable Electronic Device	2017-03-14
United States	U.S. 9,615,791 to Zhang	Wearable Device And Method For Manufacturing The Same	2017-04-11
United States	U.S. 9,626,478 to Armstrong	System And Method For Tracking Biological Age Over Time Based Upon Heart Rate Variability	2017-04-18
United States	U.S. 9,639,119 to Seok	Curved Body And Wearable Device Therewith	2017-05-02
United States	U.S. 9,639,120 to Wu	Heat Dissipation Structure Of Wearable Electronic Device	2017-05-02
United States	U.S. 9,711,060 to Lusted	Biometric Sensor Ring For Continuous Wear Mobile Data Applications	2017-07-18
United States	U.S. 9,795,323 to Yuen	Methods And Systems For Generation And Rendering Interactive Events Having Combined Activity And Location Information	2017-10-24
United States	U.S. 9,801,553 to Chadderdon	System, Method, And Computer Program Product For The Real-Time Mobile Evaluation Of Physiological Stress	2017-10-31

United States	U.S. 9,833,159 to Chu	Wearable Electronic Device	2017-12-05
United States	U.S. 10,042,422 to Morun	Systems, Articles, And Methods For Capacitive Electromyography Sensors	2018-08-07
United States	U.S. 10,061,350 to Magi	Wearable Electronic Device Including A Shape Memory Material For Opening, Closing Or Adjusting Strap Portions Of The Wearable Electronic Device	2018-08-28
United States	U.S. 10,152,082 to Bailey	Systems, Articles And Methods For Wearable Electronic Devices That Accommodate Different User Forms	2018-12-11
United States	U.S. 10,165,954 to Lee	Integrated Sensor Modules	2019-01-01
United States	U.S. 10,178,973 to Venkatraman	Wearable Heart Rate Monitor	2019-01-15
United States	U.S. 10,258,280 to Justice	Wearable Electronic Device	2019-04-16
United States	U.S. 10,299,736 to Najafi	Method, Device, And System For Diagnosing And Monitoring Frailty	2019-05-28
United States	U.S. 10,303,867 to Shröder	External Secure Unit	2019-05-28
United States	U.S. 10,321,829 to Colley	Measuring Chronic Stress	2019-06-18
United States	U.S. 10,327,651 to Bonomi	Resting Heart Rate Monitor System	2019-06-25
United States	U.S. 10,506,980 to Oleson	Scale For Displaying Workout Readiness	2019-12-17
United States	U.S. 10,586,620 to Iizuka	Device For Calculating Amount Of Retained Physical Activity, Method For Calculating Amount Of Retained Physical Activity And System For Calculating Amount Of Retained Physical Activity	2020-03-10
United States	U.S. 10,973,421 to Wisløff	Health Risk Indicator Determination	2021-04-13
United States	U.S. 11,185,241 to Ahmed	Automated Emotion Detection And Environmental Response	2021-11-30
United States	U.S. 11,857,337 to Miller	Power Management For Wearable Devices	2024-01-02

United States	U.S. 2002/0198443 to Ting	Method And Device For Measuring Blood Sugar Level	2002-12-26
United States	U.S. 2003/0139654 to Kim	System And Method For Recognizing User's Emotional State Using Short-Time Monitoring Of Physiological Signals	2003-07-24
United States	U.S. 2004/0039254 to Stivoric	Apparatus For Detecting Human Physiological And Contextual Information	2004-02-26
United States	U.S. 2004/0087845 to Katarow	Finger Oximeter With Remote Telecommunications Capabilities And System Therefor	2004-05-04
United States	U.S. 2005/0080344A1 to Nishii	Physical Condition Monitoring System	2005-04-14
United States	U.S. 2007/0060807 to Oishi	Detector	2007-03-15
United States	U.S. 2007/0182545A1 to Baum	Sensed Condition Responsive Wireless Remote Control Device Using Inter-Message Duration To Indicate Sensor Reading	2007-08-09
United States	U.S. 2008/0004510A1 to Tanzawa	Worn Type Electronic Device And Biological Measuring Apparatus Provided With The Same	2008-01-03
United States	U.S. 2008/0030346A1 to Despotis	Integrated Patient Diagnostic And Identification System	2008-09-09
United States	U.S. 2008/0171915 to Kawajiri	Biological Signal Measurement Device, Biological Signal Measurement Method, And Computer Program	2008-07-17
United States	U.S. 2008/0208009 to Shklarski	Wearable Device, System And Method For Measuring Vital Parameters	2008-08-28
United States	U.S. 2008/0285812 to Rensen	Personal Identification Method And Apparatus	2008-11-20
United States	U.S. 2009/0054751 to Babashan	Touchless Sensor For Physiological Monitor Device	2009-02-26
United States	U.S. 2009/0221937A1 to Smith	Activity Monitoring	2009-02-25

United States	U.S. 2010/0056886A1 to Hurbise	Vital Sign Monitor System And Method	2010-03-04
United States	U.S. 2010/0145236 to Greenberg	System And Apparatus For Continuous Monitoring Of Movement Disorders	2010-06-10
United States	U.S. 2010/0324389A1 to Moon	Body-Worn Pulse Oximeter	2010-12-23
United States	U.S. 2011/0028814 to Petersen	Medical Monitoring Patch Device And Methods	2011-02-03
United States	U.S. 2011/0068926 to Jong	Hand Ring Having A Biomedical Monitoring Function	2011-03-24
United States	U.S. 2011/0245633A1 to Goldberg	Devices And Methods For Treating Psychological Disorders	2011-10-06
United States	U.S. 2012/0016245 to Niwa	Plethysmogram Sensor	2012-01-19
United States	U.S. 2012/0075173 to Ashbrook	Apparatus And Method For User Input	2012-03-29
United States	U.S. 2012/0083710A1 to Yarden	Ergonomic Hand-Held Thermometer	2012-04-05
United States	U.S. 2012/0122519A1 to Jochheim	Wrist Phone With Improved Voice Quality	2012-05-17
United States	U.S. 2012/0203076A1 to Fatta	Portable Physiological Data Monitoring Device	2012-08-09
United States	U.S. 2012/0218184 to Wissmar	Electronic Finger Ring And The Fabrication Thereof	2012-08-30
United States	U.S. 2012/0232431A1 to Hudson	Great Toe Dorsiflexion Detection	2014-11-18
United States	U.S. 2012/0316406A1 to Rahman	Wearable Device And Platform For Sensory Input	2012-12-13
United States	U.S. 2013/0079602A1 to Picard	Analysis Of Physiology Based On Electrodermal Activity	2013-03-28
United States	U.S. 2013/0096405 to Garfio	Fingertip Pulse Oximeter	2013-04-18
United States	U.S. 2013/0120106A1 to Cauwels	Display Device, Corresponding Systems, And Methods Therefor	2013-05-16
United States	U.S. 2013/0183646A1 to Lusted	Biometric Sensing And Processing Apparatus For Mobile Gaming, Education, And Wellness Applications	2013-07-18
United States	U.S. 2013/0187789 to Lowe	Wearable Device Assembly Having Antenna	2013-07-25
United States	U.S. 2013/0226486 to Henderson	Power Management In An Activity Monitoring Device	2013-08-29

United States	U.S. 2014/0073486A1 to Ahmed	Systems, Devices And Methods For Continuous Heart Rate Monitoring And Interpretation	2014-03-13
United States	U.S. 2014/0078694A1 to Wissmar	Mobile Wristwatch Comprising Several Electrical And Micro Mechanical Components That Acts As A Central Unit For A Variety Of Tasks	2014-03-20
United States	U.S. 2014/0107498A1 to Bower	Wearable Apparatus And Associated Methods	2014-04-17
United States	U.S. 2014/0107932A1 to Luna	Platform For Providing Wellness Assessments And Recommendations Using Sensor Data	2014-04-17
United States	U.S. 2014/0135592A1 to Ohnemus	Health Band	2014-05-15
United States	U.S. 2014/0180019A1 to Martinez	Wearable Biometric Monitoring Devices, Interchangeable Accessories And Integrated Fastenings To Permit Wear	2014-06-26
United States	U.S. 2014/0198035 to Bailey	Wearable Muscle Interface Systems, Devices And Methods That Interact With Content Displayed On An Electronic Display	2014-02-03
United States	U.S. 2014/0218852A1 to Alcazar	Interchangeable Battery Wearable Device	2013-08-07
United States	U.S. 2014/0221789A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Trend Data Having User Selectable Parameters	2014-08-07
United States	U.S. 2014/0221790A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Trend Data With Feedback And Coaching Engine And Modeling Capability	2014-08-07

United States	U.S. 2014/0221791A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Data With Feedback And Coaching Engine	2014-08-07
United States	U.S. 2014/0244009 to Mestas	Activity Monitoring, Tracking And Synchronization	2014-08-28
United States	U.S. 2014/0275852 to Hong	Wearable Heart Rate Monitor	2014-05-30
United States	U.S. 2014/0279528A1 to Slaby	Wearable Authentication Device	2014-09-18
United States	U.S. 2014/0285416 to Priyantha	Short Range Wireless Powered Ring For User Interaction And Sensing	2014-09-25
United States	U.S. 2014/0364702A1 to Nasedkin	Apparatus And Method For Functional State And/Or Performance Assessment And Training Program Adjustment	2014-12-11
United States	U.S. 2014/0375465A1 to Fenuccio	Band With Conformable Electronics	2014-12-25
United States	U.S. 2015/0057511A1 to Basu	Sensor And Method For Continuous Health Monitoring	2015-02-26
United States	U.S. 2015/0092360A1 to Stillman	Battery Overmolding	2015-04-02
United States	U.S. 2015/0100245A1 to Huang	Systems, Methods, Applications For Smart Sensing, Motion Activity Monitoring, And Motion Activity Pattern Recognition	2015-04-09
United States	U.S. 2015/0116125 to Armstrong	Wristband With Removable Activity Monitoring Device	2015-04-30
United States	U.S. 2015/0118669A1 to Wisbey	System And Method For Providing An Intelligent Goal Recommendation For Activity Level	2015-04-30
United States	U.S. 2015/0119732A1 to Wisbey	System And Method For Providing An Interpreted Recovery Score	2015-04-30
United States	U.S. 2015/0120019A1 to Wisbey	System And Method For Providing Lifestyle Recommendations	2015-04-30

United States	U.S. 2015/0157256A1 to Galeev	System And Methods For Providing User Insights Based On Real-Time Physiological Parameters	2015-06-11
United States	U.S. 2015/0190072A1 to Armstrong	Systems And Methods For Displaying And Interacting With Data From An Activity Monitoring Device	2015-07-09
United States	U.S. 2015/0220109A1 to von Badinski	Wearable Computing Device	2015-08-06
United States	U.S. 2015/0277559 to Verscovi	Devices And Methods For A Ring Computing Device	2015-10-01
United States	U.S. 2015/0286277A1 to Kim	Wearable Type Electronic Device	2015-10-08
United States	U.S. 2015/0289797A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Trend Data With Activity And Pattern Detection	2015-10-15
United States	U.S. 2015/0289799A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Trend Data With Activity Detection And Feedback And Coaching Engine	2015-10-15
United States	U.S. 2015/0289800A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Data With Activity Pattern Detection And Feedback And Coaching Engine	2015-10-15
United States	U.S. 2015/0289808A1 to Pacione	System For Monitoring And Presenting Health, Wellness, Nutrition And Fitness Data With Feedback And Coaching Engine And Activity Detection	2015-10-15
United States	U.S. 2015/0289809A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Data With Feedback And Coaching Engine	2015-10-15
United States	U.S. 2015/0289812A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Data With Feedback And Coaching Engine And Modeling Capability	2015-10-15

United States	U.S. 2015/0294575A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Data With Feedback And Coaching Engine And Activity Detection	2015-10-15
United States	U.S. 2015/0294576A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Data With Feedback And Coaching Engine And Activity And Pattern Detection	2015-10-15
United States	U.S. 2015/0305688A1 to Rath	Method Of Determining Discharge Readiness Condition For A Patient And System Thereof	2015-10-29
United States	U.S. 2015/0339946A1 to Pacione	System For Monitoring And Presenting Health, Wellness And Fitness Trend Data Having User Selectable Parameters	2015-11-26
United States	U.S. 2016/0026156A1 to Jackson	Fitness Watch Case	2016-11-22
United States	U.S. 2016/0066827A1 to Workman	Pulse Oximetry Ring	2016-03-10
United States	U.S. 2016/0081627A1 to McGloin	System Method For Assessing Fitness State Via A Mobile Device	2016-03-24
United States	U.S. 2016/0120460A1 to Eom	Mobile Health Care Device And Operating Method Thereof	2016-05-05
United States	U.S. 2016/0184637A1 to Pulkkinen	Method To Determine Body's Physiological Response To Physical Exercise For Assessing Readiness And To Provide Feedback, And System For Implementing The Method	2016-06-30
United States	U.S. 2016/0209875A1 to Kim	Wearable Display Device	2016-07-21
United States	U.S. 2016/0274621A1 to Meyer	Wearable Electronic Devices And Components Thereof	2016-09-22
United States	U.S. 2016/0324462A1 to Hämäläinen	Method And System For Providing Feedback Automatically On Physiological Measurements To A User	2016-11-10
United States	U.S. 2016/0327979A1 to Lettow	Wearable Electronic Devices	2016-11-10

United States	U.S. 2017/0031449A1 to Karsten	Wearable Device	2017-02-02
United States	U.S. 2018/0014782A1 to Marcus	Finger Ring Electrocardiogram Monitor Trigger Systems And Associated Methods	2018-01-18
United States	U.S. 2017/0281081A1 to Nousiainen	A Portable Biometric Wrist Device And A Method For Manufacturing Thereof	2017-10-05
United States	U.S. 2023/0066299A1 to Park	Portable Monitoring Devices And Methods Of Operating The Same	2023-03-02
United States	U.S. 2024/0041324A1 to Yuen	Methods And Systems For Metrics Analysis And Interactive Rendering, Including Events Having Combined Activity And Location Information	2024-02-08
WIPO	WO 2007/064654 to Asada	Apparatus And Method For Blood Pressure Measurement By Touch	2007-06-07
WIPO	WO 2013/030744 to Eisen	Wearable Pulse Oximetry Device	2013-03-07
WIPO	WO 2015/076861A1 to Perahia	Master Station And Method For High-Efficiency Wi-Fi (Hew) Communication Using Multi-Device Hew Preamble	2015-05-28
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Sokwoo Rhee, <u>The ring sensor: a new ambulatory wearable sensor for twenty-four hour patient monitoring</u> , Biology Society. Vol.20 Biomedical Engineering Towards the Year 2000 and Beyond, 1998, Vol.4, p.1906-1909 vol.4.	
Russell Paul Dresher, <u>Wearable Forehead Pulse Oximetry: Minimization of Motion and Pressure Artifacts</u> , Masters Theses Worcester Polytechnic Institute (All Theses, All Years).660, 2006, <a href="https://digitalcommons.wpi.edu/etd-theses/660">https://digitalcommons.wpi.edu/etd-theses/660</a> .	
Emre Ertin, <u>AutoSense: Unobtrusively Wearable Sensor Suite for Inferring the Onset, Causality, and Consequences of Stress in the Field</u> , SenSys 2011 - Proceedings of the 9th ACM Conference on Embedded Networked Sensor Systems, 2011, p. 274-287.	
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Yu-Chi Wu, <u>A Mobile Health Monitoring System Using RFID Ring-Type Pulse Sensor</u> , 2009 Eighth IEEE International Conference on Dependable, Autonomic and Secure Computing, 2009, p.317-322
Kevin Hung, <u>Development of a wearable system integrated with novel biomedical sensors for ubiquitous healthcare</u> , 2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2012, p.5802-5805
Jyh-How Huang, <u>Experiences from deploying a heart rate monitoring system in a senior center</u> , IEEE 2013 International Conference on ICT convergence (ICTC), 2013, p.383-388
Sowjanya Arekapudi, <u>An Advanced Wireless Sensor Networks for Continuous Health Monitoring</u> , Masters Thesis University of Texas at San Antonio, Department of Electrical Engineering, December 2008
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Gauthami Tamamnagari, <u>Power Efficient Design of Finger-Ring Sensor For Patient Monitoring</u> , Master's Thesis University of Texas at San Antonio, Department of Electrical Engineering, December 2008
Peter T. Gibbs et al., <u>Active motion artifact cancellation for wearable health monitoring sensors using collocated MEMS accelerometers</u> , Smart Structures and Materials 2005: Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, 2005, p. 811-819.
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Respectfully submitted,

Dated: June 27, 2024

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**CERTIFICATE OF SERVICE**

I hereby certify that on June 27, 2024 unless otherwise indicated, one copy of the foregoing was filed/served on the following:

The Honorable Lisa R. Barton Secretary to the Commission U.S. International Trade Commission 500 E Street S.W., Room 112 Washington, DC 20436	By EDIS
The Honorable Doris Johnson Hines U.S. International Trade Commission 500 E Street S.W. Washington, DC 20436	By Email: JohnsonHines1398@usitc.gov
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*/s/ Andrea R. Solomon*

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