IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

NORTHWESTERN UNIVERSITY,

Plaintiff,

v.

FANUC CORPORATION and FANUC AMERICA CORP.,

Case No. 1:21-cv-00596

JURY TRIAL DEMANDED

Defendants.

COMPLAINT FOR PATENT INFRINGEMENT

1. Plaintiff Northwestern University ("Northwestern") brings this action for infringement of U.S. Patent Numbers 6,928,336, 6,907,317, and 7,120,508 (collectively the "patents at issue"), which claim groundbreaking intelligent assist systems in the field of collaborative robotics. Northwestern demands a trial by jury on all issues so triable and, for its complaint against defendants Fanuc Corporation and Fanuc America Corporation (collectively the "Fanuc Defendants"), alleges as follows:

THE PARTIES

2. Northwestern is a private, not-for-profit institution of higher education and research organized and existing under the laws of Illinois, with a principal place of business at 633 Clark Street, Evanston, Illinois, 60208. Northwestern is the owner and assignee of the patents at issue.

3. Upon information and belief, Defendant Fanuc Corporation is a corporation organized and existing under the laws of Japan, with a principal place of business at Oshino-mura, Minamitsuru-gun, Yamanashi Prefecture 401-0597, Japan.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 2 of 26 PageID #:2

4. Upon information and belief, Defendant Fanuc America Corporation is a corporation organized and existing under the laws of Delaware, with a principal place of business at 3900 West Hamlin Road, Rochester Hills, Michigan, 68309. Fanuc America Corporation maintains its Midwest Regional offices at 1800 Lakewood Blvd, Hoffman Estates, Illinois, 60192.

JURISDICTION AND VENUE

5. This lawsuit is an action for patent infringement arising under the patent laws of the United States, Title 35, of the United States Code.

6. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

7. Fanuc Corporation is subject to jurisdiction in the United States, and specifically in Illinois, under Fed. R. Civ. P. 4(k)(2). Fanuc has contacts with the United States that include, *inter alia*, advertising, offering to sell, and/or selling their products and software throughout the United States, including in Illinois and this District.

8. This Court has personal jurisdiction over Fanuc America Corporation because, among other things, Fanuc America Corporation maintains a place of business (its Midwest Regional Offices), sales presence, and physical location in this District and is thus subject to personal jurisdiction in the state.

9. This Court has personal jurisdiction over the Fanuc Defendants because, among other things, they have directly or through their agents and/or intermediaries, committed acts within Illinois giving rise to this action and/or have established minimum contacts with Illinois such that the exercise of jurisdiction would not offend traditional notions of fair play and justice.

10. In particular, on information and belief, the Fanuc Defendants, directly and/or through their agents and/or intermediaries, make, use, import, offer for sale, sell, and/or advertise their products and affiliated services in Illinois.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 3 of 26 PageID #:3

11. Further, on information and belief, the Fanuc Defendants have placed, and continue to place, infringing products into the stream of commerce, via an established distribution channel, with the knowledge and/or understanding that such products are sold in the United States, including in Illinois and in this District.

12. On information and belief, the Fanuc Defendants have derived substantial revenue from their infringing activity occurring in Illinois and this District and/or should reasonably expect their actions to have consequences in Illinois.

13. In addition, on information and belief, the Fanuc Defendants have knowingly induced, and continue to knowingly induce, infringement within this District by advertising, marketing, offering for sale, and/or selling devices containing infringing functionality within this District to at least resellers, distributors, customers, and/or other end users, and by providing instructions, user manuals, advertising, and/or marketing materials that facilitate, direct, or encourage the use of infringing functionality with knowledge thereof.

14. The Fanuc Defendants have committed patent infringement in Illinois that has led to foreseeable harm and injury to Northwestern.

15. Venue is proper in the Northern District of Illinois under 28 U.S.C. §§ 1391 and 1400(b) because the Fanuc Defendants either maintain a place of business in the District (e.g. Fanuc America's Midwest Regional offices) or are foreign corporations that may be sued in any judicial district. Moreover, a substantial part of the events and omissions giving rise to the claims at issue occurred in this District, including sale of the infringing products.

16. Venue is proper over Fanuc Corporation is proper in the Northern District of Illinois under 28 U.S.C. §§ 1391 and 1400(b) because the Fanuc Corporation is a foreign corporation that may be sued in any judicial district.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 4 of 26 PageID #:4

17. Venue over Fanuc America Corporation is proper in the Northern District of Illinois under 28 U.S.C. §§ 1391 and 1400(b) because a substantial part of the events and omissions giving rise to the claims at issue occurred in this District, including sale of infringing products and the maintenance of a regional office in this District.

BACKGROUND

I. Northwestern University

18. Northwestern is a world-renowned research university that fosters and creates important progress in engineering and applied science. Each year, Northwestern is ranked as one of the most innovative universities in the U.S. and in the world.

19. Northwestern is home to nearly 1,500 research laboratories across two campuses in the Chicago area. Northwestern's research laboratories are at the cutting edge of research in many fields, including medicine, biomedical research, engineering, materials and industrial processes, software, and therapeutics.

20. Much of the research at Northwestern, like the research that led to the patents at issue in this case, requires significant funding, and is financed by various public and private sources. The knowledge obtained through Northwestern's research benefits many people and organizations around the world, including educators, researchers, employees, employees, and consumers.

21. To maximize those benefits, Northwestern sometimes patents and/or commercializes inventions made by its faculty and researchers, and then returns a portion of the proceeds of those activities to fund further education and research at the University.

22. Over the past 15 years, the United States Patent and Trademark Office has awarded hundreds of patents to Northwestern, thereby recognizing the many discoveries made by its faculty and staff. These patents span numerous fields and disciplines. Many are based on

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 5 of 26 PageID #:5

groundbreaking research done at the Robert R. McCormick School of Engineering and Applied Science.

23. Established in 1909, the McCormick School of Engineering is one of twelve constituent schools at Northwestern. The McCormick School of Engineering offers Doctor of Philosophy (Ph.D.) and Master of Science (M.S.) programs and houses some of the nation's top researchers and brightest students. There are more than 207 full-time faculty on staff at the McCormick School of Engineering, which budgets more than \$1.5 billion a year for its research efforts and currently ranks 4th in the United States in industrial manufacturing and systems engineering, according to U.S. News & World Report.

24. One of the faculty members at the McCormick School of Engineering is Dr. Michael A. Peshkin, who is a Professor of Mechanical Engineering and Breed Senior Professor of Design. Dr. Peshkin is also a fellow of the National Academy of Inventors and a recipient of a number of teaching and educator awards.

25. Dr. Peshkin is a frequent collaborator with Dr. J. Edward Colgate. Dr. Colgate is also a Professor of Mechanical Engineering at the McCormick School of Engineering and the recipient of numerous awards and recognitions in the field of mechanical engineering.

26. Drs. Peshkin and Dr. Colgate are the inventors on a broad class of intelligent assist devices known as collaborative robots or "cobots." Cobots are programmable robotic manipulators and assist devices that can safely interact with human operators in a shared workspace. Prior to the invention of the cobots in the laboratory of Drs. Peshkin and Colgate, the word "cobot" did not exist. Now, according to the Wall Street Journal, the word is one "you'll need to know" for the "glossary of the future."

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 6 of 26 PageID #:6

II. Cobots

27. Drs. Peshkin and Colgate presented the first academic paper on cobots at the Proceedings of the IEEE International Conference on Robotics and Automation in April of 1996. The paper, titled "Nonholonomic Haptic Display," won the Best Conference Paper award.

28. The first patent applications covering first-generation cobots were filed in 1996 and 1997 and resulted in the issuance of United States Patent Nos. 5,923,139 and 5,952,796, respectively.

29. First-generation cobots were passive devices that assured safe human-robot interactions by having no internal source of motive power and more limited range of motion, accomplished through the use of nonholonomic joints and transmission elements that created programmable constraints.

30. Drs. Peshkin and Colgate, along with others, developed a second generation of intelligent assist devices. Unlike first-generation cobots, these computer-controlled devices could be either active or passive, and used sophisticated sensors, controls, and motor technology to allow human operators to position loads with greater degrees of freedom, speed, precision, and ease. And importantly, these new devices contained a modular architecture of programmable components coordinated through digital communication links that allowed for the creation of bespoke intelligent assist devices able to adapt to a variety of applications.

31. Work on these second-generation intelligent assist devices is protected by numerous United States patents, including the patents at issue in this case.

32. The patents at issue, U.S. Patent Nos. 6,928,336, 6,907,317, and 7,120,508, disclose an architecture, configuration system, and multi-functional hub for intelligent assist systems. These patents are attached as Exhibits 1-3.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 7 of 26 PageID #:7

33. The patents at issue are the result of the work of all named inventors on intelligent assist systems with a modular architecture. The importance of these contributions to the design and creation of cobot systems, as disclosed and claimed in the '336, '317, and '508 patents, was widely recognized in the engineering community, including by industrial robotics manufacturers such as the Fanuc Defendants, whose products incorporate Northwestern's innovations.

III. The Fanuc Defendants' Infringing Products

34. Fanue Corporation is a multi-national manufacturer of industrial robots and solutions for factory automation that conducts business throughout the world through a number of subsidiaries.

35. On information and belief, Fanuc Corporation conducts business in the United States through its wholly owned subsidiary, Fanuc America Corporation.

36. Collectively, the Fanuc Defendants design, develop, manufacture, market, and sell robots intended to be used in collaboration with humans, including the CR and CRX Series of collaborative robots; the LR Mate Series, M Series (including the M-10, M-20, M-410, M-710iC, M-900, and M-2000iA Series), and R Series (including the R-1000iA and R2000 Series) of articulated robots; the Series 30*i*/31*i*/32*i*, Series 0*i*, Power Motion *i*-A, and Series 35*i* controllers; and the iPendant Touch, CRX Tablet Teach Pendant, Intelligent Human Machine Interface (iHMI) and iH Pro panels, pendants and interfaces that are designed for use with various Fanuc controllers (the "Accused Products").

37. On information and belief, each of the Accused Products are designed to be used in close proximity with humans and contain, or are designed to work in conjunction with, a robotic arm, a control box, and a multi-function hub, in addition to the Fanuc Defendants' robot software.

38. On information and belief, the Fanuc Defendants began commercial marketing of CR and CRX Series in 2015.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 8 of 26 PageID #:8

39. On information and belief, the Fanuc Defendants began commercial marketing of their articulated robots in 2016, including:

- a. LR Mate Series;
- M Series (including the M-1iA, M-2iA, M-3iA, M-10, M-20, M-410, M-710iC, M-900, and M-2000iA Series); and
- c. R Series (including the R-1000iA and R2000 Series).

40. The Fanuc Defendants are involved in the sale and/or importation into the United States of cobot systems, including but not limited to the systems and architecture for providing modular intelligent assist systems and hubs for modular intelligent assist systems. The Fanuc Defendants' cobot systems embody and/or use the patented systems, configuration systems, and multi-function hub at issue in this case.

41. On information and belief, the Fanuc Defendants designed, developed, made, and sold infringing cobot systems despite having knowledge of the Northwestern patents at issue based, at a minimum, on its own patent prosecution activities wherein the patents at issue were cited as prior art, including but not limited to the '317 patent.

42. Furthermore, the Fanuc Defendants had knowledge of the patents at issue by virtue of its receipt of a letter from Northwestern's counsel notifying the Fanuc Defendants of their infringing conduct.

FIRST CAUSE OF ACTION

(Infringement of the '336 Patent)

43. Northwestern incorporates by reference its allegations in Paragraphs 1-42 as if fully restated herein.

44. On August 9, 2005, the United States Patent and Trademark Office lawfully issued the '336 patent, entitled "System and Architecture for Providing a Modular Intelligent Assist

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 9 of 26 PageID #:9

System." All rights, title, and interest in and to the '336 patent have been assigned to Northwestern, which is the sole owner of the '336 patent.

45. The '336 patent is valid and enforceable. The invention of the '336 patent addressed concerns specific to cobots—the need for natural and intuitive control of a payload by a human operator through easy and safe interactions with a powered robot. The '336 patent improved on the first generation of cobots by, among other things, claiming a novel modular architecture for a cobot that allows for wide flexibility and variability.

46. The Fanuc Defendants have directly, literally under 35 U.S.C. § 271(a), and/or equivalently under the doctrine of equivalents, infringed the '336 patent, by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States, without license or authority, the Accused Products.

47. The Accused Products meet each and every element of one or more claims of the '336 patent. By way of illustration only, the Fanuc Defendants' Accused Products meet each and every element of claim 1 of the '336 patent.

48. Independent claim 1 of the '336 patent recites:

An intelligent assist system having a modular architecture, comprising:

a motion module for supporting and moving a payload;

a plurality of computational nodes, at least one of the plurality of computational nodes being configured to control the motion module; and

a plurality of communication links, at least one of the plurality of communication links being between two of the plurality of computational nodes to carry information between the nodes to actuate the motion module.

49. As depicted below and described on the Fanuc website, the Fanuc Defendants describe the Accused Products as intelligent assist systems. For example, they describe the CR and CRX Series cobots, as robots that "directly collaborate with people" and are designed to work

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 10 of 26 PageID #:10

"side-by-side with humans without the need for safety fences." Notably, the Fanuc Defendants market these robots as creating "safe collaboration" through features such as safe contact stop sensor technology and customizable speed and safety settings that "allow[] the freedom to do more with shared workspaces."



MORE Freedom | Safe Collaboration

Barriers to collaboration are a thing of the past, since FANUC's CR Series Collaborative Robots safely work side-by-side with people without the need for safety fences. FANUC cobots immediately stop after coming into contact with a person or fixed object thanks to proven safe contact stop sensor technology. What's **MORE**, FANUC cobots allow for customizable speed and safety settings, allowing you the freedom to do **MORE** with shared workspaces.

See, e.g., Collaborative Robot Fanuc CR Series Cobots, available online at https://www.fanucamerica.com/products/robots/series/collaborative-robot (last visited January 31, 2021) (Exhibit 4).

50. The Fanuc Defendants' Accused Products have a modular architecture comprising at least one articulated robot arm, a control box, and pendant or human-machine interface, as depicted below with regard to the CRX Series robots. This architecture allows for customization and rapid update of software to allow greater flexibility and additional automation of the intelligent assist device.



Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 11 of 26 PageID #:11

See, e.g., CRX Collaborative Robot Series, available online at https://crx.fanucamerica.com/ (last visited January 31, 2021) (Exhibit 5).

51. In addition, the Fanuc Defendants advertise that their cobots are the only robots with easy "plug-and-play" functionality with other off-the-shelf Fanuc sensors and devices, a feature made possible by the modular architecture of the Series.



Help Your Robots "See"

FANUC *i*RVision – the fully integrated system for reliable 2D & 3D detection featuring easy-to-use plug and play, visual line tracking and bin/panel picking.

DISCOVER FANUC'S VISION PRODUCTS

See, *e.g.*, Industrial Robots for manufacturing, available online at https://www.fanucamerica.com/products/robots (last visited January 31, 2021) (Exhibit 6).

52. In the Fanuc Defendants' Accused Products, the articulated robot arm comprises a motion module, or alternatively is comprised of multiple motion modules, each of which contain at least one actuator. The robot arm can support and move a payload, as described below with the CR Series and R Series:

CR Series:



Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 12 of 26 PageID #:12

See Exhibit 4.

R Series:



See, e.g., Fanuc R-2000 Series Robots, available online at https://www.fanucamerica.com/products/robots/series/r-2000 (last visited January 31, 2021) (Exhibit 7).

53. Upon information and belief, the articulated robot arm, the control box, and the pendant and/or human-machine interface of the Fanuc Defendants' Accused Products each contain one or more computational nodes. At least one of the computational nodes is configured to control the articulated robot arm. The computational nodes further comprise a programmable logic device and execute motion control algorithms, including automatic motion control algorithms.

54. On information and belief, there are communication links between the computational node(s) of the robot arm, control box, and the pendant and/or human-machine interface of the Fanuc Defendants' Accused Prdocuts, including at least one node that actuates the motion module.

55. The Fanuc Defendants' Accused Products also include various sensors that are embedded in the articulated robot arm. Each sensor is itself a computational node. Examples of such sensors include torque, force, and motion sensors.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 13 of 26 PageID #:13

INTELLIGENCE

iRVision

Unique integrated FANUC "plug & play" visual detection system (20,2^½D, 30, 30-Laser, 30-Map) – improved flexibility for picking random stationary products. Also support in simulation SW ROBOGUIDE.

iRPickTool (Visual line tracking)

Part queue management, completely integrated in robot controller to support line tracking on moving conveyors. Combination of integrated FANUC *i*RVision with *i*RPickTool, for higher flexibility when picking random products on a moving conveyor.

iRCalibration suite

iRCalibration provide different service functions, by using of iRVision functionality, to simplify robot mastering, remastering, UFrame and UTool setting, Frame shifting and coordinated pair setting (precise and easy setup of coordinated robots and/or positioners).

Force Sensors

Integrated FANUC force sensor provides .touch sense" for highly sensitive force control to realize assembly, deburring, polishing and many other applications. 3D Area Sensor Unique integrated 3D high speed vision detection system for bin picking of random products and depalletsing.

Intelligence functions

dedicated functions with keen instructions, interfaces, screens and exclusive features to simplify and standardise the programming, setup and operation of your robot.

Ş

See, e.g., Fanuc Robots Product Overview, available online at https://se-pdf.s3.amazonaws.com/pdf/2497/1.pdf (last visited January 31, 2021) (Exhibit 8).

56. On information and belief, the computational nodes on the Fanuc Defendants' Accused Products are connected by a plurality of communication links. At least one of the communication links carries information between the nodes to actuate the articulated robot arm, as advertised below with the arm air, I/O, and ethernet capabilities of the CR Series.



Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 14 of 26 PageID #:14

57. In violation of 35 U.S.C. § 271(b), the Fanuc Defendants have been and are indirectly infringing the '336 patent by inducing infringement of this patent by others who use the Fanuc Defendants' Accused Products.

58. The Fanuc Defendants' affirmative acts of making, selling, and offering to sell its services and/or products, or components thereof, cause the Fanuc Defendants' Accused Products to be used in a manner that infringes the '336 patent.

59. The Fanuc Defendants further provide guidance and instruction to third parties to use the Accused Products in their normal and customary way to infringe the '336 patent.

60. The Fanuc Defendants specifically intend that its customers infringe the '336 patent. The Fanuc Defendants perform the acts that constitute induced infringement with knowledge of the '336 patent and with knowledge or willful blindness that the induced acts would constitute infringement.

61. In violation of 35 U.S.C. § 271(c), the Fanuc Defendants have been and are indirectly infringing the '336 patent by contributing to the infringement of this patent by others, such as the Fanuc Defendants' customers, in the United States.

62. The Fanuc Defendants offered to sell and have sold in the United States, and imported into the United States, the Accused Products, which are a material part of the invention of the '336 patent. The Fanuc Defendants know that the Accused Products are especially made or especially adapted for an infringing use, and not a staple article or commodity of commerce suitable for substantial non-infringing use.

63. The Fanuc Defendants have had actual notice of the '336 patent no later than May 5, 2020, when counsel for Northwestern sent the Fanuc Defendants a letter identifying the '336 patent and Accused Products that infringe the '336 patent.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 15 of 26 PageID #:15

64. The Fanuc Defendants willfully infringe the '336 patent by deliberately engaging in acts of infringement on an ongoing basis with knowledge of the '336 patent.

SECOND CAUSE OF ACTION

(Infringement of the '317 Patent)

65. Northwestern incorporates by reference its allegations in Paragraphs 1-64 as if fully restated herein.

66. On June 14, 2005, the United States Patent and Trademark Office issued the '317 patent, entitled "Hub for a Modular Intelligent Assist System." All rights, title, and interest in and to the '317 patent have been assigned to Northwestern, which is the sole owner of the '317 patent.

67. The '317 patent is valid and enforceable. The invention of the '336 patent addressed concerns specific to cobots—the need for natural and intuitive control of a payload by a human operator through easy and safe interactions with a powered robot. The '317 patent improves on the first generation of cobots by, among other things, claiming a hub for an intelligent assist system, which controls the systems and helps impart wider flexibility and variability.

68. The Fanuc Defendants have directly, literally under 35 U.S.C. § 271(a), and/or equivalently under the doctrine of equivalents, infringed the '317 patent, by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States, without license or authority, the Accused Products.

69. The Accused Products meet each and every element of one or more claims of the '317 patent. By way of illustration only, the Fanuc Defendants' Accused Products meet each and every element of claim 1 of the '317 patent.

70. Independent claim 1 of the '317 patent recites:

A multi-function hub for use in an intelligent assist system, the multi-function hub comprising:

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 16 of 26 PageID #:16

a physical interface configured and arranged to be a central interface point for an operator;

a computational node disposed on the physical interface, the computational node comprising programmable logic for implementing program controlled functions; and

an input/output ("I/O") interface for interfacing with an information network and disposed on the physical interface, the I/O interface being adapted to communicate with the computational node on the physical interface and at least one computational node disposed on the other module via a common data link, and the I/O interface uses a digital communication protocol to communicate with the computational node on the other module via the communicate with

71. On information and belief and as depicted below, the Fanuc Defendants make, use,

and sell several multi-function hubs for use with the Accused Products, including but not limited to the iPendant Touch and the CRX Tablet Teach Pendant pendants; the *i*HMI and Panel *i*H Pro human-machine interfaces; and the Series 30*i*/31*i*/32*i*-Model, Series 0*i*-Model, Power Motion *i*-A, and Series 35*i*-Model controllers and CNCs.

72. The Fanuc Defendants' multi-function hubs contain a physical interface configured and arranged to be a central point for a user to interface with the computational nodes of the cobot system, including the control box and the articulated robot arm, as depicted below with the iPendant Touch and iHMI.



iPendant Touch:

See, e.g., New Fanuc iPendant touch, available online at https://www.fanuc.eu/ua/en/robots/accessories/robot-controller-and-connectivity/ipendant-touch (last visited January 31, 2021) (Exhibit 9).

iHMI:



Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 18 of 26 PageID #:18

See, e.g., Fanuc *i*HMI Intelligent Human Machine Interface, available online at https://www.fanuc.eu/ua/en/cnc/ihmi (download flyer) (last visited January 31, 2021) (Exhibit 10).

73. On information and belief, the physical interface of the iPendant Touch and CRX Tablet Teach Pendant, as well as the *i*HMI and Panel *i*H Pro for use with various Fanuc controllers and CNCs, contain at least one computational node.

74. The Fanuc Defendants' iPendant Touch, CRX Tablet Teach Pendant, *i*HMI and Panel *i*H Pro for use with various Fanuc controllers and CNCs, were designed to master even complex operating tasks easily with an intuitive user interface. To do so, these multi-function hubs are suitable for use in a wide variety of languages for operation and programming. And on information and belief, each hub offers suitable programable logic that can be used to create complex and customized programs for various functions, including motion and tasks to be completed by the robot arm.



Touch screen as standard

The lightweight and ergonomically designed FANUC iPendant Touch with its intuitive graphic user interface provides user-friendly programming for both programmers and on-site operators.

See, e.g., Exhibit 9.

75. The iPendant Touch, CRX Tablet Teach Pendant, as well as *i*HMI and Panel *i*H Pro for use with various Fanuc controllers and CNCs, contain an input/output interface for interacting with an information network that is disposed on the physical interface of the hub.

76. On information and belief, the input/output interface on these multi-function hubs is adapted to communicate with the computational node on the physical interface of the hub and

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 19 of 26 PageID #:19

at least one computational node disposed on the robot arm, CNC or controller through a common data link.

77. On information and belief, the multi-function hubs use a digital communication protocol to communicate via the common data link.

78. In violation of 35 U.S.C. § 271(b), the Fanue Defendants have been and are indirectly infringing the '317 patent by inducing infringement of this patent by others who use the Fanue Defendants' Accused Products.

79. The Fanuc Defendants' affirmative acts of making, selling, and offering to sell its services and/or products, or components thereof, cause the Fanuc Defendants' Accused Products to be used in a manner that infringes the '317 patent.

80. The Fanuc Defendants further provide guidance and instruction to third parties to use the Accused Products in their normal and customary way to infringe the '317 patent.

81. The Fanuc Defendants specifically intend that its customers infringe the '317 patent. The Fanuc Defendants perform the acts that constitute induced infringement with knowledge of the '317 patent and with knowledge or willful blindness that the induced acts would constitute infringement.

82. In violation of 35 U.S.C. § 271(c), the Fanuc Defendants have been and are indirectly infringing the '317 patent by contributing to the infringement of this patent by others, such as the Fanuc Defendants' customers, in the United States.

83. The Fanuc Defendants offered to sell and have sold in the United States, and imported into the United States, the Accused Products, which are a material part of the invention of the '317 patent. The Fanuc Defendants know that the Accused Products are especially made or

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 20 of 26 PageID #:20

especially adapted for an infringing use, and not a staple article or commodity of commerce suitable for substantial non-infringing use.

84. The Fanuc Defendants have had actual notice of the '317 patent no later than May 22, 2007, when it was cited to the United States Patent and Trademark Office as relevant prior art to U.S. Patent No. 7,221,119, titled "Robot System" and assigned to Fanuc Ltd.

85. The Fanuc Defendants willfully infringe the '317 patent by deliberately engaging in acts of infringement on an ongoing basis with knowledge of the '317 patent.

THIRD CAUSE OF ACTION

(Infringement of the '508 Patent)

86. Northwestern incorporates by reference its allegations in Paragraphs 1-85 as if fully restated herein.

87. On October 10, 2006, the United States Patent and Trademark Office issued the '508 patent, entitled "System and Architecture for Providing a Modular Intelligent Assist System." All rights, title, and interest in and to the '508 patent have been assigned to Northwestern, which is the sole owner of the '508 patent.

88. The '508 patent is valid and enforceable. The invention of the '336 patent addressed concerns specific to cobots—the need for natural and intuitive control of a payload by a human operator through easy and safe interactions with a powered robot. The '508 patent improves on the first generation of cobots by, among other things, claiming a configuration system for an intelligent assist system, which allows a human user to interact and use the cobot system.

89. The Fanuc Defendants have directly, literally under 35 U.S.C. § 271(a), and/or equivalently under the doctrine of equivalents, infringed the '508 patent, by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States, without license or authority, the Accused Products.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 21 of 26 PageID #:21

90. The Accused Products meet each and every element of one or more claims of the

'508 patent. By way of illustration only, the Fanuc Defendants' Accused Products meet each and

every element of claim 1 of the '508 patent.

91. Independent claim 1 of the '508 patent recites:

A configuration system for an intelligent assist system, the intelligent assist system comprising a module, and a computational node on the module, the configuration system comprising:

a host computer system capable of executing a stored program, the host computer system being in communication with the computational node via a communication link;

a graphical user interface enabling the user to manipulate objects related to the module or the computational node; and

a plurality of visual indicators corresponding to a status of the module, the computational node, or the communication link.

92. On information and belief, the Fanuc Defendants make, use, and sell several configuration systems known as controllers or computer numerical controls ("CNCs") for use with the Accused Products, including but not limited to include the Series 30*i*/31*i*/32*i*-Model CNCs, Series 0*i*-Model CNCs, Power Motion *i*-A CNC, and Series 35*i*-Model CNCs—as well as their accompanying pendants and human-machine interfaces, such as the iPendant Touch, the CRX Tablet Teach Pendant, the *i*HMI, and the Panel *i*H Pro. The Controller R-30*i*B is depicted below.



See, e.g., Fanuc R-30*i*B Plus controller, available online at https://www.fanuc.eu/pl/en/robots/accessories/robot-controller-and-connectivity (download flyer) (last visited January 31, 2021) (Exhibit 11).

93. On information and belief, the Fanuc Defendants' controllers and CNCs, as well as their accompanying pendants and human machine interfaces, are computer systems that are designed to communicate with, operate, and monitor the Fanuc Defendants' cobot systems, including the robot arm and multi-function hubs.

94. The Fanuc Defendants' controllers and CNCs, as well as their accompanying pendants and human machine interfaces, contain modular hardware and an open, PC-based software architecture that is capable of executing a stored program.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 23 of 26 PageID #:23

95. On information and belief, the Fanuc Defendants' controllers and CNCs, as well as their accompanying pendants and human machine interfaces, contain communication links between the controller and CNC, the robot arm, and/or the pendant and human machine interface that enables communication between the controller and CNC and other modules and their associated computational nodes.

96. On information and belief, the Fanuc Defendants' controllers and CNCs, as well as their accompanying pendants and human machine interfaces, contain a graphical user interface that enables a user to manipulate objects related to the articulated robot arm or related to a computational node located on the arm, including a built-in 3D interface and/or manual guide.

97. On information and belief, the Fanuc Defendants' controllers and CNCs, as well as their accompanying pendants and human machine interfaces, provide a plurality of indicators corresponding to the status of the articulated robot arm, a computational node on the arm, or the communication link between the controller, multi-function hub, and/or the arm.

98. On information and belief, the Fanuc Defendants' controllers and CNCs, as well as their accompanying pendants and human machine interfaces, facilitate the computational nodes' execution of motion control algorithms by the robot arm, including automatic motion control algorithms.

99. In violation of 35 U.S.C. § 271(b), the Fanuc Defendants have been and are indirectly infringing the '508 patent by inducing infringement of this patent by others who use the Fanuc Defendants' Accused Products.

100. The Fanuc Defendants' affirmative acts of making, selling, and offering to sell its services and/or products, or components thereof, cause the Fanuc Defendants' Accused Products to be used in a manner that infringes the '508 patent.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 24 of 26 PageID #:24

101. The Fanuc Defendants further provide guidance and instruction to third parties to use the Accused Products in their normal and customary way to infringe the '508 patent.

102. The Fanuc Defendants specifically intend that its customers infringe the '508 patent. The Fanuc Defendants perform the acts that constitute induced infringement with knowledge of the '508 patent and with knowledge or willful blindness that the induced acts would constitute infringement.

103. In violation of 35 U.S.C. § 271(c), the Fanuc Defendants have been and are indirectly infringing the '508 patent by contributing to the infringement of this patent by others, such as the Fanuc Defendants' customers, in the United States.

104. The Fanuc Defendants offered to sell and have sold in the United States, and imported into the United States, the Accused Products, which are a material part of the invention of the '508 patent. The Fanuc Defendants know that the Accused Products are especially made or especially adapted for an infringing use, and not a staple article or commodity of commerce suitable for substantial non-infringing use.

105. The Fanuc Defendants have had actual notice of the '508 patent no later than May 5, 2020, when counsel for Northwestern sent the Fanuc Defendants a letter identifying the '508 patent and Accused Products that infringe the '508 patent.

106. The Fanuc Defendants willfully infringe the '508 patent by deliberately engaging in acts of infringement on an ongoing basis with knowledge of the '508 patent.

PRAYER FOR RELIEF

WHEREFORE, Northwestern respectfully requests that this Court:

- a. enter a judgment that the Fanuc Defendants infringe each of the asserted patents;
- b. order an award of damages to Northwestern in an amount adequate to compensate Northwestern for the Fanuc Defendants' infringement, said damages to be no less than

a reasonable royalty;

- c. enter a judgment that the infringement was willful and treble damages under 35 U.S.C.
 § 284;
- d. order an accounting to determine the damages to be awarded to Northwestern as a result of the Fanuc Defendants' infringement, including an accounting for infringing sales not presented at trial and award additional damages for any such infringing sales;
- e. assess pre-judgment and post-judgment interest and costs against the Fanuc Defendants, together with an award of such interest and costs, in accordance with 35 U.S.C. § 284;
- f. render a finding that this case is "exceptional" and award to Northwestern its costs, expenses, and reasonable attorneys' fees, as provided by 35 U.S.C. § 285;
- g. grant other and further relief as the Court may deem proper and just.

Case: 1:21-cv-00596 Document #: 1 Filed: 02/02/21 Page 26 of 26 PageID #:26

JURY DEMAND

Pursuant to Fed. R. of Civ. P. 38, Northwestern respectfully requests a jury trial on all issues and claims so triable.

Dated: February 2, 2021

Respectfully submitted,

NORTHWESTERN UNIVERSITY

By: <u>/s/ Nevin M. Gewertz</u> Nevin M. Gewertz Rebecca T. Horwitz BARTLIT BECK LLP 54 W. Hubbard Street, Suite 300 Chicago, Illinois 60654 Tel.: 312-494-4400 Fax: 312-494-4440 nevin.gewertz@bartlitbeck.com rebecca.horwitz@bartlitbeck.com

> Meg E. Fasulo BARTLIT BECK LLP 1801 Wewatta Street, Suite 1200 Denver, Colorado 80202 Tel.: 303-592-3100 Fax: 303-592-3140 meg.fasulo@bartlitbeck.com

Counsel for Plaintiff