AMENDMENTS TO THE SPECIFICATION:

Please amend the Abstract as follows:

A guide system and method of projecting visual indicators onto a physical object to guide actions of an individual comprises providing a guide system ~~(200)~~ having a guide system controller ~~(220)~~ and a projector ~~(266)~~, with the guide system controller including a plurality of addressed display features ~~(286)~~. An input signal ~~(207)~~ is provided to the guide system controller ~~(220)~~ whereby an addressed display feature is selected based on the input signal and the projector ~~(266)~~ projects a visual indicator corresponding to the selected addressed display feature onto a physical object. The guide system controller ~~(220)~~ may also include a plurality of positional identifiers ~~(288)~~, with the method including the selecting of a positional identifier based on the input signal and the projecting of the visual indicator onto a physical object at a location corresponding to the selected positional identifier.

A clean copy of the substitute Abstract with the above changes accompanies this paper.

SUBSTITUTE ABSTRACT

ABSTRACT

A guide system and method of projecting visual indicators onto a physical object to guide actions of an individual comprises providing a guide system having a guide system controller and a projector, with the guide system controller including a plurality of addressed display features. An input signal is provided to the guide system controller whereby an addressed display feature is selected based on the input signal and the projector projects a visual indicator corresponding to the selected addressed display feature onto a physical object. The guide system controller may also include a plurality of positional identifiers, with the method including the selecting of a positional identifier based on the input signal and the projecting of the visual indicator onto a physical object at a location corresponding to the selected positional identifier.

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(72) **Inventors; and**

(75) **Inventors/Applicants** *(for US only)*: **RYZNAR, Paul** [US/US]; 49601 Deer Run Drive, Northville, Michigan 48167 (US). **RYZNAR, James** [US/US]; 11535 Ryznar Drive, Belleville, Michigan 48111 (US).

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(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

[Continued on next page]

(54) **Title**: LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

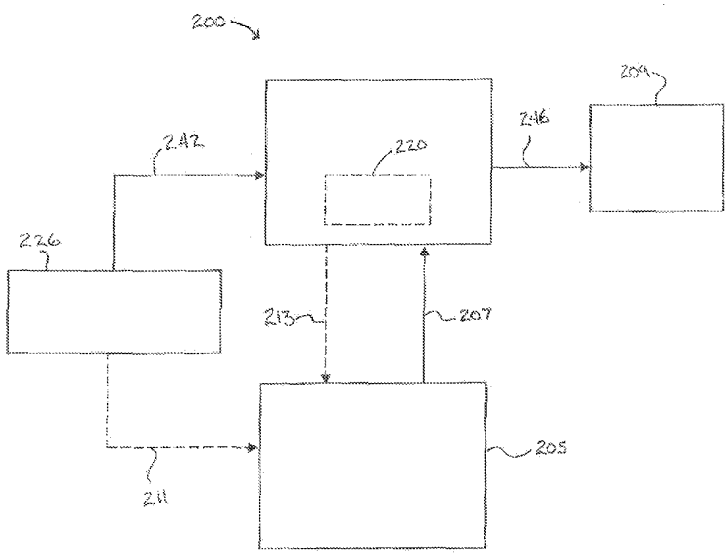


FIG. 3

(57) **Abstract**: A guide system and method of projecting visual indicators onto a physical object to guide actions of an individual comprises providing a guide system (200) having a guide system controller (220) and a projector (266), with the guide system controller including a plurality of addressed display features (286). An input signal (207) is provided to the guide system controller (220) whereby an addressed display feature is selected based on the input signal and the projector (266) projects a visual indicator corresponding to the selected addressed display feature onto a physical object. The guide system controller (220) may also include a plurality of positional identifiers (288), with the method including the selecting of a positional identifier based on the input signal and the projecting of the visual indicator onto a physical object at a location corresponding to the selected positional identifier.

WO 2012/109593 A1

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

REMARKS

Prior to examination, Applicants respectfully request that the amendments set forth above be entered in the application. Please enter the above amendments prior to calculation of the filing fees. No new matter has been added. The amendments are fully supported by the disclosure as originally filed. Entry of these amendments, and examination of the application based on the above amendments, is respectfully requested. Please also enter the accompanying Substitute Abstract submitted herewith.

Respectfully submitted,

PAUL RYZNAR and JAMES RYZNAR

By: Gardner, Linn, Burkhart & Flory, LLP

Date: August 9, 2013

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RYZ01 P-101A
	Application Number	
Title of Invention	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
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☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

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Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Paul		Ryznar	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Northville	State/Province	MI	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i] US

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Address 2			
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Postal Code	48167	Country [i]	US

Applicant 2 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	James		Ryznar	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Belleville	State/Province	MI	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i] US

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City	Belleville	State/Province	MI
Postal Code	48111	Country [i]	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RYZ01 P-101A
	Application Number	
Title of Invention	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD	

Customer Number	15671		
Email Address	ondersma@glbf.com	Add Email	Remove Email

Application Information:

Title of the Invention	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD		
Attorney Docket Number	RYZ01 P-101A	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	14	**Suggested Figure for Publication (if any)**	3

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	15671		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	a 371 of international	PCT/US2012/024730	2012-02-10
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
PCT/US2012/024730	non provisional of	61441897	2011-02-11

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RYZ01 P-101A
	Application Number	
Title of Invention	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD	

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

If the Assignee is an Organization check here. ☒			
Organization Name	OPS Solutions LLC		
Mailing Address Information:			
Address 1	49601 Deer Run Drive		
Address 2			
City	Northville	**State/Province**	MI
Country [i] US		Postal Code	48167
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/			Date (YYYY-MM-DD)	2013-08-09
First Name	Karl	Last Name	Ondersma	Registration Number	55894

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RYZ01 P-101A
	Application Number	
Title of Invention	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE CLAIMS:

The listing of the claims will replace all prior versions and listings of claims in the application. Please amend claims 3 and 5, and cancel claims 24-29 as follows:

1. (original) A method of projecting visual indicators onto a physical object to guide actions of an individual, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of addressed display features;

providing an input signal to said guide system controller;

selecting an addressed display feature based on said input signal; and

projecting a visual indicator corresponding to said selected addressed display feature onto a physical object.

2. (original) The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting a positional identifier based on said input signal, and wherein said projecting a visual indicator further comprises projecting a visual indicator corresponding to said selected addressed display feature onto a physical object at a location corresponding to said selected positional identifier.

3. (currently amended) The method of claim 1 ~~or 2~~, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution system.

4. (original) The method of claim 3, wherein said manufacturing execution system receives a signal from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signal received by said manufacturing execution system from said sensor apparatus.

5. (currently amended) The method of claim 1 ~~or 2~~, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller.

6. (original) The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. (original) The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. (original) The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. (original) The method of claim 1, wherein said visual indicator comprises at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. (original) The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on said visual indicator.

11. (original) The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. (original) The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator, and wherein said method comprises recording images while an operator is guided by said guide system.

13. (original) The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. (original) The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. (original) A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers;

said guide system controller receiving an input signal with said guide system controller causing said directional light device to project a visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal.

16. (original) The guide system of claim 15, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution system.

17. (original) The guide system of claim 15, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller.

18. (original) The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

19. (original) The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. (original) The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. (original) The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator.

22. (original) The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. (original) The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. – 29. (canceled)

CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method of projecting visual indicators onto a physical object to guide actions of an individual, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of addressed display features;

providing an input signal to said guide system controller;

selecting an addressed display feature based on said input signal; and

projecting a visual indicator corresponding to said selected addressed display feature onto a physical object.

2. The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting a positional identifier based on said input signal, and wherein said projecting a visual indicator further comprises projecting a visual indicator corresponding to said selected addressed display feature onto a physical object at a location corresponding to said selected positional identifier.

3. The method of claim 1 or 2, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution system.

4. The method of claim 3, wherein said manufacturing execution system receives a signal from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signal received by said manufacturing execution system from said sensor apparatus.

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5. The method of claim 1 or 2, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller.

6. The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. The method of claim 1, wherein said visual indicator comprises at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on said visual indicator.

11. The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator, and wherein said method comprises recording images while an operator is guided by said guide system.

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13. The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers;

said guide system controller receiving an input signal with said guide system controller causing said directional light device to project a visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal.

16. The guide system of claim 15, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution system.

17. The guide system of claim 15, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller.

18. The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

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19. The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator.

22. The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

a guide system controller;

a projector, said projector being selectively operable to project and target a visual indicator; and

a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator;

said guide system controller receiving an input signal with said guide system controller causing said projector to project a visual indicator onto a physical object based on said input signal and with said guide system controller recording images and time durations while an individual is guided by said visual indicator.

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25. The guide system of claim 24 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

26. The guide system of claim 25, wherein said guide system controller includes a plurality of programmed addressed display features and a plurality of programmed positional identifiers, and wherein said guide system controller causes said projector to project said visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal.

27. The guide system of claim 24 further comprising a motion sensor, said motion sensor detecting three dimensional spatial motion.

28. The guide system of claim 27 wherein said motion sensor outputs a confirmation signal when the three dimensional spatial motion detected by said motion sensor complies with a desired action.

29. A guide system adapted to provide visual indicators to an individual to guide sequential actions, said guide system comprising:

an operational guide system comprising:

a directional light device, said directional light device being selectively operable to project and target at least one indicating light to produce a visual indicator;

a controller, said controller receiving input signals and selectively providing command signals to said directional light device in response to said input signals wherein the projection of said indicating light is indicative of said command signal; and

a manufacturing execution system interfaced with said operational guide system, said manufacturing execution system operable to provide data inputs to said operational guide system, said data inputs comprising input signals to said controller.

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(54) **Title**: LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

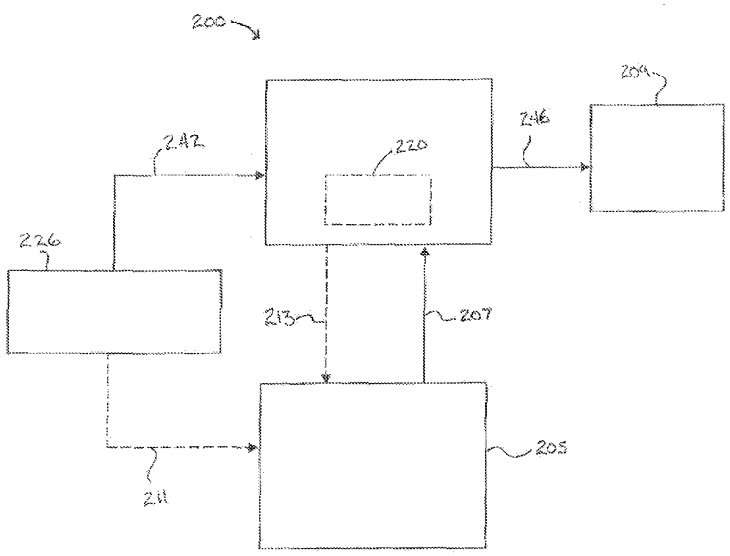


FIG. 3

(57) **Abstract**: A guide system and method of projecting visual indicators onto a physical object to guide actions of an individual comprises providing a guide system (200) having a guide system controller (220) and a projector (266), with the guide system controller including a plurality of addressed display features (286). An input signal (207) is provided to the guide system controller (220) whereby an addressed display feature is selected based on the input signal and the projector (266) projects a visual indicator corresponding to the selected addressed display feature onto a physical object. The guide system controller (220) may also include a plurality of positional identifiers (288), with the method including the selecting of a positional identifier based on the input signal and the projecting of the visual indicator onto a physical object at a location corresponding to the selected positional identifier.

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LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority of U.S. provisional application, Ser. No. 61/441,897 filed February 11, 2011, by Paul Ryznar and James Ryznar for LIGHT GUIDED ASSEMBLY SYSTEM, which is hereby incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The present invention is directed to improvements in a system for guiding an individual in the performance of operational steps, and in particular a system that provides visual indicators to the individual.

[0003] U.S. Patent No. 7,515,981 provides a LIGHT GUIDED ASSEMBLY SYSTEM for aiding human actions. Numerous activities involve the performance of pre-designated operational steps to properly complete a particular task, with some such activities needing to be completed within a specified or standard time allowance. Problems arise when such activities are improperly performed either from a workmanship standpoint and/or outside the standard time allowance, both of which add significant and undesirable cost and complexity to the manufacturing operations. In the case of failure to meet a standard time allowance, an entire assembly process may become unbalanced resulting in costly bottlenecks and excess inventory.

[0004] In addition to manufacturing assembly operations, numerous other activities involve human performance of particular tasks that are desired to be performed without omitting any steps.

SUMMARY OF THE INVENTION

[0005] The present invention provides a guide system adapted to provide visual indicators to an individual to guide actions.

[0006] According to an aspect of the present invention, a method of projecting visual indicators onto a physical object to guide actions of an individual comprises providing a guide system having a guide system controller and a projector, with the guide system controller including a plurality of addressed display features. The method further comprises providing an input signal to the guide system controller, selecting an addressed display feature based on the input signal, and projecting a visual indicator corresponding to the selected addressed display feature onto a physical object. The guide system controller may further include a plurality of positional identifiers with the method further comprising selecting a positional

Amazon Ex. 1002.0022

identifier based on the input signal, and projecting a visual indicator corresponding to the selected addressed display feature onto a physical object at a location corresponding to the selected positional identifier.

[0007] The guide system controller may be interfaced with a manufacturing execution system (MES), wherein the input signal is provided to the guide system controller from the manufacturing execution system. Alternatively or additionally, the guide system controller may be interfaced with a system controller that controls the operation of an automated process, wherein the input signal is provided to the guide system controller from the system controller. The system controller may be a programmable logic controller and receive signals from a sensor apparatus, wherein the input signal is provided to the guide system controller based on signals received by the system controller from the sensor apparatus. The system controller may be interfaced with a manufacturing execution system. Either the manufacturing execution system and/or the system controller may receive signals from a sensor apparatus, or receive manually input signals, with such signals comprising or deriving an input signal to the guide system controller prompting the projection of a visual indicator.

[0008] The method may further comprise the providing of a confirmation signal to the guide system controller in response to completion of an action by an individual based on the visual indicator. A sensor apparatus may be provided that is operable to detect completion of the action, with the sensor apparatus generating a confirmation signal.

[0009] The guide system may further include a camera operable to image at least one of actions of an individual guided by the visual indicator and the visual indicator, with the method further including recording images while an operator is guided by the guide system and/or recording the time duration while an operator is guided by the guide system. Simultaneously recorded images and recorded time durations may be displayed, such as on a monitor, for evaluating process improvements.

[0010] A guide system for providing visual indicators to an individual to guide actions in accordance with an aspect of the invention comprises at least one directional light device selectively operable to project and target at least one indicating light, a guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers. The guide system controller receives an input signal and causes the directional light device to project a visual indicator corresponding to an addressed

Amazon Ex. 1002.0023

display feature onto a physical object at a location corresponding to a positional identifier based on the input signal.

[0011] The guide system controller may be interfaced with a manufacturing execution system to provide the input signal to the guide system controller, or may be interfaced with a system controller that controls the operation of an automated process to provide the input signal to the guide system. Both the manufacturing execution system and a system controller, such as a programmable logic controller, may receive signals from a sensor apparatus, wherein the input signal is provided to the guide system controller based on the signals received by the manufacturing execution system and/or the system controller from the sensor apparatus. The system controller may be interfaced with a manufacturing execution system.

[0012] A camera operable to image the actions of an individual guided by a visual indicator or a visual indicator itself may be included in the guide system where a controller, such as the guide system controller, records images and time durations while an operator is guided. A monitor interfaced with the guide system controller may be used to view recorded images and time durations.

[0013] Still further, a guide system adapted to provide visual indicators to an individual to guide actions in accordance with the present invention comprises a guide system controller, a projector selectively operable to project and target a visual indicator, and a camera operable to image at least one of actions of an individual guided by the visual indicator or the visual indicator. The guide system controller receives an input signal and causes the projector to project a visual indicator onto a physical object based on the input signal with the guide system controller recording images and time durations while an individual is guided by the visual indicator, which recorded images and time durations may be viewable on a monitor. The guide system controller may include a plurality of programmed addressed display features and a plurality of programmed positional identifiers, wherein the guide system controller causes the projector to project the visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on the input signal.

[0014] A motion sensor may be incorporated with any of the guide systems, with the motion sensor detecting three dimensional spatial motion of an individual, a product, or a workstation process guided by a visual indicator. The motion sensor may output a confirmation signal when the three dimensional spatial motion detected by the motion sensor complies with a

Amazon Ex. 1002.0024

desired action, where the confirmation signal may be transmitted to the guide system controller and/or other controllers.

[0015] According to another aspect of the invention, a guide system adapted to provide visual indicators to an individual to guide sequential actions comprises an operational guide system interfaced with an operational software system or manufacturing execution system, with the operational guide system comprising at least one directional light device selectively operable to project and target at least one indicating light and a controller, with the controller receiving input signals and selectively providing command signals to the directional light device in response to the input signals wherein the projection of the indicating light is indicative of the command signal. The operational software system being operable to provide data inputs to the operational guide system that comprise input signals to the controller. The controller may be programmed with a plurality of addressed display features and a plurality of programmed positional identifiers, where the controller receives an input signal and causes the directional light device to project a visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on the input signal.

[0016] The indicating light may create a human readable display image based on the data inputs, and may comprise numbers, words, alphanumeric characters, a drawing image and/or a video image. The data inputs may alternatively or additionally direct the projection location of the indicating lights. The operational guide system may further include a sensor apparatus that is operable to detect operation information and generate an output indicative of the operation information. Conditional programming can also be employed to redirect an operator to a different set of process steps dependent on the outcome of prior steps as determined by the operator, controller, confirmation devices, and/or computer MES system or the like.

[0017] According to another aspect of the invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises at least one directional light device, a guide system controller, and a camera. The directional guide light device being selectively operable to project and target at least one indicating light for guiding actions of an individual and the guide system controller receiving an input signal and selectively providing a command signal to the directional light device in response to the input signal, wherein the projection of the indicating light is indicative of the command signal. The camera is operable to image the actions of an individual guided by the operational guide system and/or the impingement of the indicating light on an object. Images recorded by the

Amazon Ex. 1002.0025

camera can be viewed in combination with recorded cycle time data to review the recorded process steps and determine corrective actions to optimize the process and/or reduce cycle times.

[0018] In particular embodiments the camera may be a video camera. A monitor may be interfaced with the guide system controller such that images take by the camera are viewable on the monitor. A light controller may be interfaced with the guide system controller for providing input signals to the guide system controller for operatively controlling the projection of the indicating light. A camera controller may also be interfaced with the guide system controller, with the camera controller being operable to control the zoom, viewing position, and/or focus of the camera. Still further, a computer may be interfaced with the guide system controller, such as a distally located computer, with the images taken by the camera being viewable on a monitor of the computer. The computer may also be operable to provide input signals to the guide system controller for operatively controlling the projection of the indicating light and/or the zoom, viewing position, and/or focus of the camera.

[0019] According to yet another aspect of the invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions includes a projection surface having a front surface and a rear surface opposite the front surface. A directional light device selectively projects and targets at least one indicating light on the rear surface of the projection surface to create display images on the projection surface, wherein the display images are viewable by an individual viewing the front surface of the projection surface to guide actions of the individual.

[0020] According to another aspect of the invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises at least one directional light device, a guide system controller, and a motion sensor. The directional guide light device being selectively operable to project and target at least one indicating light for guiding actions of an individual and the guide system controller receiving an input signal and selectively providing a command signal to the directional light device in response to the input signal, wherein the projection of the indicating light is indicative of the command signal. The motion sensor detects three dimensional spatial motion, such as of the individual, product, or workstation process being guided by the indicating light.

[0021] In particular embodiments, the three dimensional spatial motion of the individual detected by the motion sensor comprises a confirmation signal when the detected motion

Amazon Ex. 1002.0026

complies with a desired action. For example, the three dimensional spatial motion of the individual detected by the motion sensor may be transmitted to the guide system controller for comparison with the desired action.

[0022] The operational guide system of the present invention is thus readily programmable and adaptable to provide a cost effective and accurate method of guiding an individual through a series of tasks and may also provide confirmation that the tasks have been fully completed in the proper order, as well as additional information regarding cycle times and images recorded during operations.

[0023] These and other objects, advantages, purposes, and features of this invention will become apparent upon review of the following specification in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a perspective view of an operational guide system constructed as an assembly guide system at a work station of an assembly line;

[0025] FIGS. 1A-1L illustrate exemplary images that may be projected by the light sources of the assembly guide system of FIG. 1;

[0026] FIG. 2 is a schematic illustration of the operation of the assembly guide system of FIG. 1;

[0027] FIG. 3 is a schematic illustration of an alternative operational guide system in accordance with the present invention interfaced with a manufacturing execution system;

[0028] FIG. 3A is a schematic illustration of a guide system controller of the guide system of FIG. 3 including a programmed addressed visual display features and a matrix of positional identifiers;

[0029] FIG. 3B is a schematic illustration of projectors of the guide system of FIG. 3 projecting visual indicators onto objects corresponding to the addressed visual display features and positional identifiers of FIG. 3A;

[0030] FIG. 3C is a schematic illustration of the interfacing of the manufacturing execution system and guide system of FIG. 3;

[0031] FIG. 3D is a schematic illustration of a guide system interfaced with a system controller of an automated process, and of a manufacturing execution system interfaced with the system controller;

[0032] FIG. 3E schematically illustrates various alternatives by which a guide system controller may receive input signals and confirmation signals;

Amazon Ex. 1002.0027

[0033] FIG. 4 is a schematic illustration of an alternative operational guide system in accordance with the present invention incorporating a camera device;

[0034] FIGS. 5A-5C schematically illustrate a projection surface that may be incorporated with an operational guide system in accordance with the present invention;

[0035] FIG. 6 is a schematic illustration of an alternative operational guide system in accordance with the present invention incorporating a three dimensional spatial motion sensor; and

[0036] FIG. 7 is a schematic illustration of an operational guide system in accordance with the present invention in operation simultaneously guiding activities of multiple individuals.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0037] The present invention is directed toward advances in an operational light guide system that projects lights to guide actions by one or more individuals, such as the operational guide system disclosed in U.S. Patent No. 7,515,981, which is hereby incorporated by reference.

[0038] With reference to FIGS. 1-2, U.S. Patent No. 7,515,981 discloses an operational guide system or guide system 10 in connection with the providing of visual indicators to an operator 12 performing one or more assembly actions on a work piece 14 at a work station 16 of an assembly line 18. The illustrated guide system 10 includes a controller or a control module 20, two directional light devices 22, 24, a sensor apparatus 26, and a confirmation module or device or element 28, shown as a foot pedal 30. Guide system 10 includes a component location 32, which is illustrated as a parts bin 34, a display device 36, and a tool 38 and tool holder 40.

[0039] Guide system 10 is operable, in response to an operation information or characteristic or identification information associated with work piece 14 detected by sensor apparatus 26, to selectively provide indicating lights 46, 52 to guide an operator in the selection and/or assembly of parts to work piece 14, with the indicating lights 46, 52 being directed and/or provided based on, at least in part, the operation information detected by sensor apparatus 26. The system 10 is also or alternatively operable in response to one or more confirmation signals, such as confirmation signals 48, 56, and/or 84 of FIG. 2 that are described below, which may be manually or automatically supplied to control module 20 to verify completion of a particular operation or task. The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing

Amazon Ex. 1002.0028

completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.

[0040] Referring to FIGS. 1 and 2, when work piece 14 initially enters work station 16, the sensor apparatus 26 detects an operation information or characteristic or identification information associated with the work piece 14, such as, for example, the presence of and/or the type of work piece 14 present at the work station 16. In response to the detection by sensor apparatus 26, a first input signal 42 is communicated or transmitted to the control module 20 and, based on the detected or identified work piece 14 that the operator 12 is or will be working on, the control module 20 communicates or transmits a command signal 44 (FIG. 2) to directional light device 22 to project an indicating light 46 at a location on parts bin 34 to guide the operator 12 to a part required for a particular step in the assembly action. After the proper part has been selected, a confirmation signal 48 (FIG. 2) is sent to the control module 20, the control module 20 then transmits a command signal 50 (FIG. 2) to directional light device 24 to project indicating light 52 to indicate the operational step location 54 on the work piece 14 where the selected component is to be installed. Upon completion of a particular operation step, the operator 12 actuates the foot pedal 30 to transmit a confirmation signal 56 (FIG. 2) to the control module 20 verifying that the operation step has been completed. The control module 20 may then send another command signal 49, 50 to one of the directional light devices 22, 24 to indicate the next operation step, or may release the work piece 14 to a subsequent work station 58, 60 for further operations if all required pick and assembly steps have been properly completed.

[0041] Guide system 10 is able to provide visual indicators to operator 12 that are specific to a particular work piece 14 such that, for example, multiple different styles or types of work pieces requiring different components or parts may be processed at work station 16 with a significant reduction in the risk of the occurrence of assembly errors. The assembly guide system 10 thus provides a cost effective and accurate method of guiding an operator 12 through a series of tasks and provides confirmation that the tasks have been fully accomplished and completed in the proper order. The control module 20 may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station 16 for system productivity reporting, or the like.

[0042] Assembly guide system 10 is shown in FIG. 1 in connection with work station 16, where work station 16 is part of an assembly line 18 that includes additional work stations 58,

Amazon Ex. 1002.0029

60 for performing subsequent operations. Additional assembly guide systems could be included at the other work stations of assembly line, or a single assembly guide system could be used to aid operations at more than one work station.

[0043] As noted, sensor apparatus 26 functions to detect an operation information or characteristic or identification information associated with work piece 14, such as the presence and/or type of work piece 14 located at the work station 16, and may be constructed as one or more of a number of known sensors such as, for example, a proximity switch, light curtain, photo eye, radio frequency identifier device, bar code reader, or the like. When constructed as a radio frequency identifier device or bar code reader, a readable tag or bar code may be placed on either the work piece or the structure upon which the work piece is supported while traveling on the assembly line. The tag or bar code may contain information regarding the type of work piece at the work station, such as the model of the work piece, measurements related to the work piece, or the type of components required. A scanner or reader may be handheld by the operator or mounted to the assembly line, with the scanner being able to read the information from the tag or bar code when the work piece enters the work station. Alternatively, a sensor apparatus may comprise a vision system configured to detect an identifiable characteristic or identification information associated with a work piece. Guide system 10 may alternatively be activated or sequentially stepped to subsequent operations by non-automated signals. For example, an operator may manually enter a part type into the system, depress a palm button, press a touch screen, or simply commence operations or pre-operations on a part.

[0044] The type of part present at a particular work station need not be determined using a bar code or radio frequency system. For example, and as is known in the art, standard binary type sensors or cameras may be used to detect geometrically distinguishing features of a work piece or the structure upon which it is located to "identify" the work piece. Still further, an assembly guide system could be constructed where an operator uses a hand held scanner to scan a bar code label affixed to the work piece or the structure supporting the work piece as opposed to the scanner being mounted directly to the assembly line. The sensor apparatus may also be used to detect the relative orientation of a work piece with respect to the work station, with the control module adapted to receive the positional information and provide accordingly adjusted command signals to the directional light devices such that the projected indicating lights accurately impinge on the desired operational step locations. Still further, the

Amazon Ex. 1002.0030

presence of a part at a work station may be supplied to the operational guide system by a manual operator activated input signal, such as by a touch screen, a palm button, or the like.

[0045] Control module 20, in the illustrated embodiment, is a computer controller device and as indicated is adapted to receive and send various signals to monitor and guide the assembly actions at work station 16. Control module 20 may be constructed as a desktop or laptop style PC, a PLC, or the like, or may be a networked computer system that may be used to control and monitor other aspects of the assembly line and work stations.

[0046] As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. In the illustrated embodiment of FIG. 1, the first input signal 42 is transmitted to the control module 20 directly from the sensor apparatus 26 along communication link 62, where link 62 is a computer cable, fiber optic line, or the like. Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station. The identification information, as previously indicated, may simply indicate the presence of a part at the work station and/or may include information regarding the type of work piece at the work station, such as the model of the work piece, measurements related to the work piece, or the type of components required. Optionally, a sensor apparatus and control module may be alternatively constructed to wirelessly transmit and receive identification information.

[0047] In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42. In the illustrated embodiment, two substantially similar directional light devices 22, 24 are provided at work station 16 and are responsive to the command signals 44, 50 of the control module 20. Directional light device 22 is used to project indicating lights 46 at the component location 32, while the other directional light device 24 is used to project indicating lights 52 at operational step locations 54 on work piece 14. Each directional light device 22, 24 includes a light source 66 for projecting indicating lights 46, 52, with the directional light devices 22, 24 constructed such that the indicating lights 46, 52 may be selectively and movably positionable to direct the indicating light 46, 52 at pre-targeted locations. The light sources 66

Amazon Ex. 1002.0031

may also be constructed to provide an indicating light beam of selectively adjustable brightness to compensate for ambient surroundings and/or the distance from the light source to the selected impingement point. Although light sources 66 are illustrated in FIG. 1 as projecting a single indicating light beam, it should also be appreciated that light sources 66 may be constructed to simultaneously project two or more beams such that, for example, multiple parts may be indicated for selection from location 32 by the operator 12 or multiple assembly locations may be indicated.

[0048] Light sources 66 may be constructed as laser light sources that are able to project a focused, coherent beam of light at a desired location. Laser light sources may preferably be class 3 or lower lasers for employment within a visual setting for operators. Alternatively, light sources other than lasers may be used and still function as intended, such as standard projectors, incandescent lights, light emitting diodes (LEDs), or the like.

[0049] Light sources 66 may be constructed such that they produce light of differing color from each other to provide further visual cues to the operator 12 while working at work station 16. Furthermore, light sources may be adapted to project animated images or videos onto a surface, such as a surface of the work piece 14, assembly line 18, or a work station 16, 58, 60. The projected animated images or videos may be, for example, a training video, and may be in a .mpeg, .wmv, or other such file format provided by or stored in, for example, a control module of an operational guide system.

[0050] Referring to FIGS. 1A-1L, the directional light devices 22, 24 may also include known optical effect devices for fanning or adapting or configuring the projected indicating lights 46, 52 produced by the light sources 66 into a desired shape, pattern, or form at the point or location at which the indicating light 46, 52 impinges the component location 32 or operational step location 54. For example, the indicating light may initially be projected as a geometric shape (FIGS. 1J-1L), such as a circle, about a particular location to quickly attract the operator's attention, and then focus to a point or circle of smaller diameter at the specific location. The indicating light may also be projected to produce alpha numeric characters, such as shown in FIGS. 1A-1I, blink, and/or produce rotating images. For example, sequential numbers may be projected where each number indicates a step in the assembly action being preformed by the operator at the work station, or part numbers or textual information may be projected to provide written guidance to the operator. Indicating lights projected by light sources, as described in more detail below, may further be configured to

Amazon Ex. 1002.0032

display videos or pictures or animation on the surface upon which the indicating light impinges. The configured images form a type of display graphic or visual display feature ("VDF") exhibited by an indicating light, such as indicating light 46 or 52, when projected onto a surface, with FIGS. 1A-1L representing exemplary display graphics or VDFs.

[0051] As previously noted, indicating lights 46, 52 may be projected at component location 32 or at operation step locations 54 associated with work piece 14. Component location 32 is exemplified as a parts bin 34 having multiple storage locations 70 for holding various parts required in the assembly of work pieces 14. As shown, directional light device 22 is functional to selectively project an indicating light 46 at discrete storage locations 70 of parts bin 34 in response to command signal 44 to prompt the operator 12 regarding part selection.

[0052] RFID tags, or the like, may also be used to supply information to the control module 20. For example, an RFID tag located on a parts bin 34 may be used in connection with assembly guide system 10 for monitoring the presence and/or proper location of the parts bin 34. In the event assembly guide system 10 detected, such as by control module 20, the absence of parts bin 34 an error message could be, for example, displayed by display device 36, or projected by a light device 22, 24, or an audible warning message may be broadcast.

[0053] In the illustrated embodiment of FIG. 1, storage locations 70 of parts bin 34 include detection devices 72 that are intended to detect or sense when a component has been withdrawn from a particular storage location 70. Detection devices 72 may be of known construction and are selected based on a particular application, taking into consideration the types or models of work pieces 14 and parts to be assembled. Detection devices 72, for example, may comprise light curtains, proximity sensors, electronic mats, such as pressure sensitive mats, machine vision systems, or the like.

[0054] The detection devices 72 are operable to transmit a confirmation signal 48 to the control module 20 along link 74 upon selection by the operator 12 of a part from a particular storage location 70, with control module 20 being functional to determine whether or not the operator 12 has selected the correct part as prompted. In response to the confirmation signal 48, if the operator 12 selected the proper part as directed by the indicating light 46, control module 20 may terminate the indicating light 46 projecting from directional light device 22 at the storage location 70 and transmit a subsequent command signal 50 to directional light device 24 to project an indicating light 52 to the operational step location 54 on the work piece 14 where the just selected part is to be assembled. However, if control module 20

Amazon Ex. 1002.0033

determines that an incorrect part has been selected as compared to what should have been selected as prompted by the indicating light 46, control module 20 will not provide the subsequent command signal 50. In addition, control module 20 may be constructed to provide a visual or audible signal to the operator 12 when an improper part has been selected from a storage location 70.

[0055] Although not illustrated, the parts bin may additionally employ a known pick-to-light system whereby each storage location includes an illumination device, such as an LED light or the like, that lights up to prompt the operator as to the proper storage location from where a part is to be selected. When the assembly guide system includes such a pick-to-light system, the directional light device 24 used to project an indicating light 46 at a component location 32 may optionally be excluded.

[0056] As noted above, assembly guide system 10 includes confirmation module 28, which in the illustrated embodiment is a foot pedal 30. Confirmation module 28 is constructed to transmit a confirmation signal 56 along link 76 to control module 20 to signal that the operational step indicated by directional light device 22 or 24 has been completed. To transmit the confirmation signal 56, operator 12 simply depresses foot pedal 30 upon completion of the directed activity. The confirmation signal 56 transmitted by foot pedal 30 then triggers control module 20 to selectively transmit another command signal 44, 50 to provide guidance to the operator 12 regarding the subsequent operational step that must be taken by the operator 12 at the work station 16 in accordance with work piece 14. For example, the assembly guide system 10 may cause an indicating light 46 to be projected at a storage location 70 for the next required part. Alternatively, the control module 20 may provide a command signal that releases the work piece to the next work station 58 if all of the operational steps at the current work station 16 have been completed.

[0057] Although illustrated as a foot pedal 30, it should be understood that numerous alternative confirmation modules 28 may be utilized. For example, confirmation module 28 may be constructed as a pressure sensitive mat, push button, toggle switch, palm button, light curtain, touch screen, touch pad, part present sensor or the like, which is constructed to be depressed, switched, or otherwise activated by a manual action of the operator 12. A sound activated signal may alternatively be employed, such as a voice command, to provide a confirmation signal. Confirmation module 28 may also be constructed as a wireless transmitter, thereby eliminating the need for a physical link. Further, operational guide..

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system may be adapted to receive and/or respond to other confirmation signals and/or sources as additional technologies become available.

[0058] Still further, a confirmation module or device or element may be constructed to automatically detect when an operator has completed a manual step. For example, a confirmation module may be constructed as a vision system that is able to detect the presence or absence of a component at a location, such as by processing an image captured by a pixilated imaging device, as is known in the art. Alternatively, for example, the confirmation module may be constructed as a proximity sensor, photo eye, light curtain, or the like, constructed to automatically detect the presence or absence of a part upon assembly to the work piece. Still further, a confirmation signal may be transmitted by an automated tool or measuring device, such as a torque gun, weight scale or other type of measuring device, as described in more detail below. In which case, the automated tool or measuring device may function as a confirmation module. An indicating light projected by a light source of an operational guide system may also be used to provide a confirmation signal where, for example, a sensor is employed at the light source or elsewhere on the operational guide system to detect the reflection of an indicating light from a part or component that requires verification. The light sources may also be used as a "light curtain" by being projected at a particular location or parts bin, or the like, with a sensor adapted to detect that an operator has properly selected from that location.

[0059] It should also be appreciated that an operation information could be transmitted to the controller 20 from a remote signal. For example, in the case of a part kitting operation, an order request may be transmitted to a work station from a central processing location, such as a computer system or the like, and transmit a signal to the work station regarding, for example, what parts to gather and/or assemble. In which case, the work piece of the operation may comprise a collection of parts assembled into a parts holder.

[0060] Although not illustrated, an assembly guide system may also incorporate known ultrasonic, electromagnetic, and/or similar technology used to confirm, for example, that a tool is placed onto the proper bolt or nut at an assembly operation. Such technology is configured to send and receive ultrasonic frequencies with the spatial location of a sent or received signal being monitored to confirm that an operation is performed at a proper location. Thus, an assembly guide system may be configured to utilize both light sources and

Amazon Ex. 1002.0035

ultrasonic, electromagnetic, and or similar technology to confirm assembly or other manual process steps.

[0061] Assembly guide system 10 also includes a display device 36 that is able to receive display signals 78 (FIG. 2) along link 80 (FIG. 1) from control module 20 and to relay information to the operator 12. Display device 36 may be constructed as a television, LCD, LED device, or other type of viewable display mechanism. Display device 36 may be used to present information to the operator 12 such as, for example, the sequential steps needing to be performed, work instructions associated with the work station 16, images of a work piece 14 properly affixed with the part that is to be assembled, information regarding a missed or improperly performed assembly step, or the like. In the case of sequential steps, display device 36 may be configured to highlight the current step under consideration and/or provide an indication that previous steps have been completed. The display device 36 may be constructed as a touch screen device adapted to be depressed by an operator to provide a confirmation signal regarding completion of a particular step. The inclusion of such a touch screen device may also provide the ability to prompt or guide an operator through certain operational or assembly steps that do not require guidance via indicating light signals. The display device may also be used to show or provide instructional videos, display running cycle times, desired cycle times, and/or alerts, or the like. In the case of a touch screen, the touching by an operator of a particular location or tab area of the screen may display of a video or an image on the display screen, or another display screen, or may initiate the projection of an indicating light or video.

[0062] Optionally, assembly guide system 10 may be used in connection with a tool 38 and a tool holder 40. Tool 38 may comprise, for example, a manual tool such as a wrench, torque wrench, pliers, screwdriver, or the like, or may be an automated tool such as an electric screwdriver, air gun, electric torque wrench, or the like. Tool 38 may otherwise be a manual or automated measuring device such as calipers, a gauge block, feeler gauges, air gauge device, or the like. Tool holder 40 is intended to provide a storage location for tool 38 when tool 38 is not in use. Directional light devices 22, 24 may project an indicating light onto tool 38 and/or tool holder 40 in response to a command signal when tool 38 is required to complete a pending operational step, such as in a similar manner as described above with respect to storage locations 70 of parts bin 34 and operation step locations 54 on work piece 14. Tool holder 40 may include a sensor and thereby be integrated with the assembly guide

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system 10 to detect when tool 38 is positioned within or removed from tool holder 40, where the sensor may be a photo eye, proximity switch, light curtain, or the like.

[0063] Although not illustrated, the assembly guide system may utilize an automated gauge or tool that is electrically linked to control module such that control module is able to monitor both the use of the tool as well as an operational parameter associated with the tool. For example, if a tool is constructed as a torque wrench, the control module may be constructed to monitor the fastening torque obtained by the torque wrench and to compare the value to a preprogrammed or predetermined or threshold value prior to transmitting a subsequent command signal. The control thus may function to transmit the subsequent command signal only after the desired or appropriate torque has been applied by the torque wrench. Similarly, if the tool is constructed as a measuring device, such as digital calipers, control module may be constructed to receive a measurement value, and may compare the measurement value to a threshold measurement value, and may communicate or transmit the subsequent command signal when the measurement value is at or near the threshold measurement value.

[0064] Control module 20 is illustrated as transmitting command signal 44a to directional light device 22, which in response to command signal 44a, projects indicating light 46a on storage location 70a of parts bin 34. Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part. Operator 12 then activates foot pedal 30 (or other confirmation device), which transmits confirmation signal 56a to control module 20 and the above process is repeated for indicating lights 46b, 52b, 46c, 52c, storage locations 70b, 70c, and operational step locations 54b, 54c.

[0065] As described in more detail below, the control module 20 and directional light devices 22, 24 of the assembly guide system 10 are programmed as to the proper spatial positioning to where an indicating light 46, 52 is to be projected. This teaching of the assembly guide system 10 may be accomplished in various ways. For example, one teaching method involves the use of known pendant device technology, where the pendant device is used to position the projected beam of the light source 66 to a proper location, such as a storage location 70, record the coordinates, and then move to the next location, such as onto the work piece 14. Control module may also be adapted to employ voice activated programming. Alternatively,

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a wireless transmitter may be used that may be positioned at a desired impingement point of the projected indicating light 46, 52 and functional to transmit the spatial positioning information to the control module. Similarly, various locations, such as part bins, may be provided with wireless transmitters, such as RFID tags, with the control module being adapted to detect the signal and direct the indicating lights accordingly, in which case the operational guide system is able to compensate for movement or shifting of the desired impingement points of the indicating lights. Still further, control module 20 may be directly programmed and, for example, may utilize a touch screen having an image of the work station with the control module 20 being programmable using the touch screen. An operational guide system may also alternatively be programmed via a computer, such as desktop or laptop or networked computer, without the above noted peripheral equipment and using standard hardware such as a mouse to program the control module. The operational guide system may also employ an alignment test pattern that may be used to "calibrate" the system, such as at the beginning of a shift, to insure that the various indicating light signals are properly aimed.

[0066] Guide system 10 also includes cycle time monitoring with display device 36 including display fields which may be used to display to an operator the running time or remaining allowable time associated with performance of an operational step, previous running times, average running times, and/or target times for completion of the operational steps. For example, cycle time monitoring display fields may show the cycle time to perform one or more previous or completed operational steps, while cycle time monitoring display field and/or shows the cycle time of the preceding and current operational cycle. A cycle time measurement may, for example, be initiated upon receipt of a first input signal 42 from sensor apparatus 26, and completed upon detection of a confirmation signal 48, 56, 84. Cycle time measurements of given operations or steps may be recorded and statistically reviewed, such as based on longest to shortest duration, and may be viewed remotely from guide system 10, such as by connecting guide system 10 with a networked computer system.

[0067] As previously noted, control module 20 may also be used to monitor and record various parameters useful for improving productivity. For example, control module 20 may record cycle times of the individual operational steps at a work station 16 and/or the combined cycle time of operations at a work station 16. Correspondingly, control module 20, or another such computational device, may record and provide charts or reports regarding recorded error data, such as on mis-performed steps, and/or cycle times. In addition, such data may be

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linked or otherwise networked, or even monitored via the internet, such that the variously above noted cycle times or performance parameters may be monitored from a remote computer, with such data being viewable in a live format or archived.

[0068] Although not shown, it should also be appreciated that the operational guide system may be adapted to additionally provide audio guidance and/or instruction, such as voice or sound type instruction.

[0069] It should be appreciated that numerous alternative structures and methods are contemplated within the scope of the operational guide system. For example, an operational guide system need only utilize a single directional light device for projecting indicating lights at both a component location as well as operational step locations on a work piece. An operational guide system also need not employ a component location, but rather may employ one or more tools with directional light devices functioning to project indicating lights at the various tools. Furthermore, it should also be appreciated that the assembly guide system 10 of FIGS. 1 and 2 may be alternatively constructed whereby the various links are not formed by computer cables or the like, but are rather formed as wireless connections between the various devices. Still further, each assembly step need not involve both the selection of a part and the assembly of the part to a work piece.

[0070] Operational guide systems may also be incorporated into assembly line systems with the guide systems simultaneously moving along with the item or device being assembled or constructed on the assembly line.

[0071] The operational guide system may also be configured for use with a stand alone work station as opposed to a work station integrated into an assembly line as shown in FIG. 1.

[0072] It should also be appreciated that numerous alternative uses and/or configurations of the operational guide system exist. For example, an operational guide system may be used to pick and package products into a shipping container, such as a bag or box, for fulfilling an order, such as part kitting at order fulfillment centers, supermarkets, part bin loading, assembly line sequencing, product changeovers, or the like. The operational guide system may also be used in a food production or preparation process in which, for example, the indicating lights may be projected onto sequentially required ingredients and may be timed depending upon when a particular ingredient is to be added.

[0073] FIG. 3 discloses an improved operational guide system 200, where guide system 200 shares similar components or elements with guide system 10, such that not all of the specific

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construction and alternatives are discussed with regard to guide system 200. Guide system 200 is integrated or interfaced with an operational program system or operational software system or manufacturing execution system (MES) 205 whereby operational software system 205 may provide operational guide system 200 with input signals or data inputs 207 to create, control or cause the projector of operational guide system 200 to project specific display images 209 via the projected indicating light 252 and/or project in specific locations. Manufacturing, production, and/or assembly environments frequently employ operational software systems 205, which are sometimes referred to as enterprise resource planning (ERP) systems, used in association with product planning, production scheduling, inventory control, and the like. These systems are generally defined as control systems for managing and monitoring work-in-process in a factory environment, such as on a factory floor. Examples of such operational software systems include, but are not limited to, SAP ® business software provided by SAP AG of Germany, PROPLANNER ® business software provided by Proplanner Corp. of Iowa, USA, as well as systems such as General Motor Corporation's Global Enterprise Production Information and Control System (GEPICS). Such operational software systems 205 can include data that may be utilized by guide system 200 to assist in guiding the activities of an individual without the necessity of having such information separately programmed or pre-programmed into guide system 200. For example, operational software system 205 may include part or component information, such as bill of material (BOM) information, including information categorized by part or product for separate operational steps in an assembly operation or the like, including part numbers and/or part descriptors, that may be transmitted to guide system 200. Operational software system 205 may also include ordered operational process descriptions as used, for example, for time and cost analysis purposes, which information may also be transmitted to guide system 200. Operational software system 205 may still further include images of parts, components, decals, labels and the like that may be transmitted to guide system 200.

[0074] Accordingly, operational software system 205 may be interfaced with operational guide system 200 as shown in FIG. 3 whereby the data transmitted by operational software system 205 may be directly projected by guide system 200 or used in combination with information programmed into guide system 200 to project indicating lights 246 to create desired images 209. Data inputs 207 transmitted by operational software system 205, such as to a control module or controller or guide controller 220 of guide system 200, may be used to

create numerous display images 209, including part numbers, part descriptions, work instructions and/or graphics, such as images of parts, decals, or label. As discussed above with regard to the embodiment of FIG. 1, controller 220 includes software for controlling operation of guide system 200, with controller 220 receiving inputs from operational software system 205 directing use and placement of VDFs. For example, data inputs 207 transmitted from operational software system 205 related to part information may be projected or used by guide system 200 to project a particular part number for display to an operator and/or may trigger guide system 200 to project a display image at a particular location wherein a desired part is stored. Data inputs 207 from operational software system 205 related to sequential operational process descriptors may be projected or used to project step-by-step work instructions to an operator for accomplishing a particular task. Graphical data inputs 207 from operational software system may be projected or used by guide system 200 to project a depiction of a part, label, or decal, which may, for example, be displayed to help an individual correctly identify and/or position a particular item. Moreover, the data inputs 207 from operational software 205 may be used and projected with or combined with standard or programmed images, such as images illustrated in FIGS. 1A-1L.

[0075] Referring now to FIG. 3A in connection with the operation of guide system 200, controller 220 is illustrated to include a VDF address table or listing 286, as well as numerous positional identifiers 288 contained in an address table or matrix or positional listing 289. Controller 220 includes numerous pre-programmed VDFs that are each assigned a unique identifier 287, which in the illustrated embodiment for exemplary purposes comprises a horizontal axes with letters "A" to "H" and a vertical axes with the numerals "1" to "7". For example, the textual VDF "Select 1" is associated with the address identifier A1, and the textual VDF "Part 6" is associated with the address identifier F6. In addition to textual VDFs, VDF address table 286 includes images (see A2 to H2), videos (see A4 to H4), and drawings (see A5 to H5). The videos and drawings in FIG. 3A are identified with brackets for explanation purposes, but should be understood that when projected, such as by a projector 266, would form a visual indicator comprising an image, video or drawing, such as a picture or blueprint, on the projection surface. Each unique VDF contains unique characteristic and combination of characteristics including, but not limited to, color, font size, font type, width, height, rotation angle, animation type, alphanumeric code, etc.

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[0076] In the illustrated embodiment positional listing 289 includes positional identifiers or addresses 288 associated with three separate physical objects, with the objects being identified or represented within positional listing 289 of controller 220 as canvas A, canvas B and canvas C. As shown in the illustrated embodiment, canvas A is associated with positional identifiers PA1 to PA9, canvas B is associated with positional identifiers PB1 to PB16, and canvas C is associated with positional identifiers PC1 to PC16. As described in more detail below, in the illustrated embodiment guide system 200 includes three projectors 266a, 266b, 266c, with each projector being used to project light to form VDFs on the three separate physical objects. The various positional identifiers 288 in listing 289, therefore, represent a location, such as by X, Y, Z spatial coordinates, on the physical object to which a projector and VDFs would be directed. Accordingly, controller 220 is programmed with the locations of nine positions on the physical object associated with canvas A (PA1 to PA9), with the locations of sixteen positions on the physical object associated with canvas B (PB1 to PB16), and with the locations of sixteen positions on the physical object associated with canvas C (PC1 to PC16). Guide system 200 may be taught the positional identifiers in any of the manners discussed above, for example, or utilizing other techniques. Furthermore, multiple projectors may be utilized for each physical object as necessary, with each projector responsible for a specific canvas, or area on the object, and associated positional identifiers.

[0077] With reference to the embodiment of FIG. 3B, three separate physical objects are disclosed, including a parts rack 290, a movable sequence rack 291 that is used to transport parts between parts rack 290 and a vehicle 292, such as may be located on an assembly line. With reference to FIG. 3A, parts rack 290 is the physical object associated with canvas A, sequence rack 291 is the physical object associated with canvas B, and vehicle 292 is the physical object associated with canvas C. Further, projector 266a is utilized to project VDFs onto parts rack 290, projector 266b is utilized to project VDFs onto sequence rack 291, and projector 266c is utilized to project VDFs onto vehicle 292. Parts rack 290 contains nine separate parts bins for containing different parts, with each bin labeled in brackets in FIG. 3B as Part 1 to Part 9 for explanation purposes. It should be understood that this bracketed labeling does not represent the projection of a VDF onto parts rack. Sequence rack 291 includes sixteen separate storage locations within which parts may be stored for sequential assembly to vehicle during assembly. Moreover, the nine positional identifiers PA1 to PA9 associated with canvas A correspond to the physical location of each of the nine separate parts

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bins of parts rack, and the sixteen positional identifiers PB1 to PB16 associated with canvas B correspond to the physical location of each of the sixteen storage locations of sequence rack.

[0078] Thus, in operation, guide system 200 may be prompted to project a particular VDF based on an address identifier 287 onto a surface of a particular object based on a positional identifier 288, with the projected VDF thereby forming a visual indicator on the object. With reference to the embodiment of FIG. 3B, for example, the VDF "Select 3" of address identifier C1 is projected by projector 266a onto parts rack at positional locations associated with the positional identifiers of PA2, PA3 and PA7 to prompt an operator to select three of each of Part 2, Part 6 and Part 7, respectively. Likewise, the VDF "Select 1" of address identifier A1 is projected by projector 266a onto parts rack at the positional location associated with the positional identifier of PA3 to prompt an operator to select a single one of Part 3.

[0079] Subsequent to the selection of a particular part, an operator may be prompted to place the selected part into particular storage locations on sequence rack 291. For example, the VDF "Part 2" of address identifier B6 is projected by projector 266b onto storage locations on sequence rack at the positional locations associated with the positional identifiers of PB1, PB3 and PB6 to create visual indicators and prompt the operator to place one each of the three selected Part 2 type of part into the three separate indicated storage locations. Similarly, the VDF "Part 3" of address identifier C6 is projected by projector 266b onto the storage location of sequence rack 291 at the positional location associated with the positional identifier PB7 to prompt the operator to place the selected Part 3 type of part into the indicated storage location.

[0080] Still further, guide system 200 may subsequently be utilized to aid in the assembly of the parts placed within sequence rack 291 onto vehicle 292, as well as perform additional assembly operations on vehicle 291. For example, VDFs associated with address identifiers B6, C6, D6, F6, G6 and H6 may be projected by projector 266c onto specific locations on vehicle 292 where at the particular selected part is to be assembled in the sequence associated with their storage on sequence rack, with the positional locations for assembly to vehicle 292 being defined by the positional identifiers PC1 to PC16. Still further, additional VDFs may be projected onto vehicle 292, such as are listed as A3 to F3 in VDF address table 286, for example, to direct inspection, alignment, masking or other such operations.

[0081] It should be appreciated that confirmation signals may be provided with regard to verification that the various activities undertaken by an operator as prompted by guide system

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200 were properly completed, such as in the manner disclosed above with respect to guide system 10, such as by a confirmation module. For example, parts rack 290 and/or sequence rack 291 may provide confirmation signals by way of machine vision systems, light curtains, push buttons, as well as spatial recognition systems. Similarly, operations associated with vehicle 292 may similarly be confirmed.

[0082] Accordingly, guide system 200 may be dynamically used to project selected VDFs onto particular locations of an object by selecting a VDF via its associated VDF address identifier 287 and directing a projector 266 to project the selected VDF by a positional identifier 288. This operational approach simplifies the use and employment of guide system 200 by enabling flexible programming to guide system 200, including as may be required due to product and model changes.

[0083] In the embodiment of FIG. 3, data inputs 207 are employed to coordinate the selection of VDFs based on the associated address identifier, as well as the positional location of where the VDF is to be projected based on the positional identifier. Referring now to FIG. 3C, the interface of operational software 205 with the controller 220 of guide system 200 is illustrated. A communication link 293 between system 205 and controller 220 is used for the exchange of data, with communication link 293 comprising a standard communication protocol such as TCP/IP or the like. Controller 220, which includes hardware and software, includes an application program 294 for interfacing with the operational software 205, where application program 294 may be customized based on the specific type or program of operational system 205 employed. Also included is a guide system program 295, with guide system program 295 including the above noted address table 286 and positional listing 289. In one embodiment application program 294 and guide system program 295 may interact via an application programming interface (API) such as Windows Communication Foundation (WCF). Accordingly, guide system program 295 of guide system 200 can be utilized with multiple different operational software systems 205 based on the customization of application program 294 for the particular operational software system 205 employed. Data inputs or signals to controller 220, such as signals representing part numbers, product model numbers, operational steps, and the like, are interpreted by controller 220 via application program 294 and guide system program 295 to cause the proper selection of a VDF based on the address identifier and project it at the appropriate location based on the positional identifier.

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[0084] As previously noted, operational systems 205 may include detailed information regarding production processes, including the location and status of particular objects being assembled, as well as the parts required to be assembled. For example, operational software systems 205 can track the model and location of a vehicle on an assembly line and thereby interact with guide system 200 in the manner described above to coordinate the providing of the appropriate components and assembly actions. Thus, operational software system 205 may provide data streams of input signals 207 to guide system 200 to enable desired VDFs to be projected at desired locations. Interfacing guide system 200 with operational software system 205 reduces the amount of separate programming required for guide system 200, as well as enables real time or dynamic creation of visual indicators or display images 209 for guiding the activities of an individual. Thus increasing the flexibility of guide system 200 based on changing operational requirements of an assembly, inspection or other process requiring guidance assistance via guide system 200.

[0085] With further reference to FIG. 3, a sensor apparatus 226 may be provided, such as sensor apparatus 26 described above in reference to FIGS. 1 and 2, that may be used for triggering or sending data inputs to guide system 200 for part selection and/or confirmation. For example, upon activation of guide system 200 to perform a particular guidance procedure based on detection of a component or required assembly or inspection steps, sensor apparatus 226 may transmit a signal 211 to operational software system 205 identifying the particular component or required assembly steps pending at guide system 200. Operational software system 205 may then transmit data inputs 207 based on signal 211. Alternatively, in response to an input signal 242 transmitted by sensor apparatus 220 to guide system 200, such as to a control module of guide system 200, guide system 200 may send a signal 213 to operational software system 205 triggering the transmission of data inputs 207 to guide system 200 based on the particular component or required assembly or inspection steps pending at guide system 200. Still further, operational software system 205 and guide system 200 may be integrated or interfaced in such a manner that data within operational software system 205 is provided to or resides within guide system 200 without the need for triggering signals. As noted, sensor apparatus 226 may be a sensor apparatus component of guide system 200. Alternatively, sensor apparatus 226 may be a separate component, such as a device that detects the presence and/or type of product at guide system 200, or may be a device such as a computer for allowing manual inputs.

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[0086] Although described above in regard to the assembly of a vehicle, it should be appreciated that guide system 200 may be employed with numerous alternative processes, including assembly, inspection, sequencing, product changeover, welding, stamping, part kitting, and the like. Moreover, the guide system may include fewer or substantially more VDFs, with each having its own address identifier, as well as include additional positional identifiers. It should be further understood that numerous alternative VDFs may be employed, as well as that multiple VDFs may be simultaneously projected or projected sequentially as desired. For example, a VDF may be projected to form a visual indicator that traces a route along an object, as well as traces a route along an object at a particular speed. Such a visual indicator may be used, for example, to aid in the application of an adhesive onto the object by enabling an operator to follow the indicator to place the adhesive in the appropriate location, as well as in the proper amount based on the speed of the projected visual indicator. Still further, a guide system may include fewer or more projectors and/or enable a single projector to project onto multiple physical objects.

[0087] Although shown in connection with an operational software system in FIGS. 3 and 3C, it should be further appreciated that guide system 200 may be employed utilizing an addressed VDF listing 286 and positional identifiers 288 without an operational software system 205 and/or without a system controller as described below. In such embodiments, guide system controller 220 may be programmed by selecting VDFs to be projected based on the VDF address identifiers and the positional identifiers corresponding to the locations on a physical object, thereby providing substantial flexibility to the programming of guide system controller 220. In such an embodiment, guide system controller 220 may receive input signals directly from a sensor apparatus and/or via manual inputs from an operator.

[0088] Still further, as illustrated in FIG. 3D, guide system controller 220 may be configured for operations through a system controller 296, such as a PLC device, where the system controller 296 may operate to control an automated process, such as an assembly line 18, and provide input signals 207 to controller 220. In such an arrangement system controller 296 may communicate with controller 220 via an I/O fieldbus interface. For example, system controller 296 may receive signals 297 from a sensor apparatus, such as a bar code reader or the like, as described above in connection with system 10, and in turn provide an input signal 207 to guide system controller 220 to prompt the projection of a VDF based on an address identifier 287, at a particular physical location based on a positional identifier 288. It should

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be appreciated that application program 294 and/or guide system 295 may operate to parse or interpret the data inputs 207 to prompt selection of the appropriate address identifier and positional indicator. An alternative system controller may be employed comprising a software system, such as a soft-PLC or visual logic controller (VLC) software, or the like for example, in which case a hardware system employed with a conventional PLC device may not be required. In such a software based application the system controller may reside and operate on the guide system controller 220.

[0089] In turn, as illustrated in FIG. 3D, an operational software system 205 may provide communications to a system controller 296 that is utilized to control operation of an automated process, such as assembly line 18, as well as guide system 200. It should be appreciated with respect to FIG. 3D, however, that guide system 200 may be controlled and interact with system controller 296 without utilizing an operational software system 205. For example, system controller 296 may receive signals 297 with regard to an operational process, such as via a bar code or data reader or other such sensor, with the PLC in turn providing input signals 207 to guide system controller 220 of guide system 200 based on such signals, and with the input signals 207 being parsed or interpreted by the guide system control 220 to define the appropriate addressed VDF and positional identifier.

[0090] Thus, it should be understood that guide system controller 220 of guide system 200 may receive input signals triggering the selection of address identified VDFs and positional identifiers for directing the projection of the selected VDFs onto a desired location of a physical object from a variety of equipment, controllers and systems. For example, the input signals may be provided to the controller 220 directly from an operational system 205, where the operational system 205 may itself receive signals from a sensor apparatus 226 and the input signal provided by the operational system 205 are based on the signals received by the operational system 205 from the sensor apparatus 226. Input signals triggering such projection by guide system 200 may also or alternatively be provided directly to guide system controller 220 by a sensor apparatus 226. Still further, a system controller 296 may provide input signals triggering projection, including via the system controller 296 receiving signals from a sensor apparatus 226. It should further be appreciated that in like manner to system 10, guide system 200, including whether used as a stand alone system or in connection with a system controller 296 and/or a manufacturing execution system 205, may receive confirmation signals upon completion of an activity directed by a projected visual indicator,

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such as via the above noted techniques, including via a confirmation module 228. That is, confirmation signals may be provided directly to guide system controller 220, such as via a confirmation module 228 and/or confirmation signals may be provided to guide system controller 228 from a system controller 296 and/or an operational system 205. These various alternatives regarding input signals, confirmation signals, a sensor apparatus 226, and a confirmation module 228 are schematically illustrated in FIG. 3E, wherein it should be appreciated that the system controller 296 and/or operational system 205 may be omitted.

[0091] Referring now to FIG. 4, an operational guide system 300 is illustrated, where guide system 300 shares similar components or elements with guide system 10, such that not all of the specific construction and alternatives are discussed with regard to guide system 300. Guide system 300 includes an integrated camera device 313 that may be used to record and/or review activities by an individual being guided by guide system 300, as well as the object that is the subject of activities by the individual. Camera 313 may be a digital camera for still pictures or a video recorder, such as a webcam or a high definition video camera recorder, including a video camera capable of capturing still images. Images or videos captured by camera 313 may be recorded or stored in guide system 300 and subsequently viewed on a display device 336 of guide system 300 and/or on a separate display device remote from guide system 300, such as via a computer network. Such images or videos may be used for numerous process analysis purposes, including to develop process improvements, such as facilitating assembly steps, determine or investigate why certain operational steps exceeded a desired cycle time, and monitor causes of downtime. Images recorded by camera 313 may also be viewed in combination with recorded cycle time data to review the recorded process steps and determine corrective actions to optimize the process and/or reduce cycle times.

[0092] Still further, recorded and/or real time images from camera 313 may be viewed remotely from guide system 300, such as by interfacing guide system 300 with a monitor 315, where monitor may be (part of) a computer 317, for example, integrated with guide system 300 through an intranet or internet connection, including via a wireless connection. Computer 317 may also be used to control various aspects of guide system 300, including camera 313 and a directional light device 322 having a projecting light source. For example, in one scenario guide system 300 may be used as part of a remote training session whereby a trainer remotely located from guide system 300 may train one or more students at a remote training station utilizing guide system 300. In such a scenario, the surgeon may view with computer

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317 the object being worked on by the students via camera 313. The trainer may then control directional light device 322 by a light controller 319, such as a joystick, to project an indicating light onto a particular location of the object at the training station for directing activities of the students. In such an embodiment, guide system 300 may also include a camera controller 321, such as a separate joystick or the like, whereby the surgeon may also control aspects of the camera 313, such as the camera's viewing position, focus, and zoom. Although light controller 319 and camera controller 321 are illustrated as separate components, it should be understood that computer 317 may be used to control the directional light device and/or camera 313 without separate components. In another scenario, camera 313 may be used by a technician or engineer during programming of guide system 300, such as to program a new assembly step whereby the camera 313 would allow the programmer to view, for example, the work station and any associated part bins and properly direct the projection of an indicating light by directional light device 322.

[0093] Camera 313 may be a separately mounted camera, such as at a fixed position or mounted for movement, such as by servo motors. Still further, camera 313 may be integrated with the directional light projecting devices.

[0094] Referring now to FIGS. 5A and 5B, a directional light device 22 having a light projector 66 is illustrated relative to work station 16, such as shown with reference to operational guide system 10 and work station 16 of FIG. 1, where indicating lights projected by the light device 22 are directed at a projection surface or screen 71. Projection surface 71 allows individuals to view display images 209 projected onto surface 71 when the individuals are located on the opposite side of projection surface 71, such as when an individual is standing at work area 77, relative to directional light device 22 and may be utilized, for example, in locations in which a light projector is constrained from projecting indicating lights without being blocked by an operator or additional equipment or by components located at the work station. Images 209 projected onto a back surface or rear surface 73 of projection surface 71 are viewable by an operator stationed at work station 16 when the operator views the front surface 75 of projection surface 71 such that the operator may see and read display images 209, such as words, pictures, or videos, for guiding activities at work station. Projection surface 71 may be constructed from a conventional rear projection screen.

[0095] FIG. 5C illustrates an alternative embodiment in which projection surface 71 is mounted to work station 16 with light device 22 and light projector 66 mounted from beneath.

Amazon Ex. 1002.0049

In the embodiment of FIG. 5C, an operator stationed at work station 16 views on front surface 75 display images 209 projected on back surface 73. As illustrated, projection surface 71 may be angled or angularly inclined, such as in the range of approximately 20 to 25 degrees relative to a horizontal plane, for ease of viewing by the operator.

[0096] Although projection surface 71 described above is constructed as a rear projection screen, it should be appreciated that in an alternative embodiment a projection surface may be employed in which a directional light projection device projects images directly onto the surface viewed by an individual as opposed to the rear surface. In such an embodiment, the directional light projection device may be located above or to the side of the individual being guided.

[0097] With reference to FIG. 6, an operational guide system 400 may also be constructed to include one or more three dimensional spatial motion sensors 423 for monitoring activities of an operators body, hand, etc. and/or other surfaces related to robots, workstation hardware such as fixtures, part bins, etc. to confirm that desired operational steps are properly accomplished. Sensor 423 may, for example, be used to or as part of monitoring that particular parts were properly selected from the correct bins and placed for part kitting purposes or assembled to a work piece. Sensor 423 may additionally function as a confirmation module, such as confirmation module 28 discussed above, to provide output confirmation signals 456 comprising data related to the detected motion sensed by sensor 423, such as to guide controller or guide control module 420, where the detected motion data may be compared to predetermined required motions or actions to thereby aid in indicating or determining that the operational step indicated by the directional light device of guide system 400 has been properly completed. Alternatively, motion sensor 423 may itself include processing capability for comparing detected motion to a predetermined desired action to thereby provide a confirmation signal 456 if the guided action has been properly completed. In situations where the motion detected by sensor 423 does not match a predetermined action a signal may be transmitted, such as by a guide system controller or the sensor itself, indicating as such.

[0098] Sensor 423 may, for example, employ Microsoft Corporation's KINECT three dimensional spatial motion sensor technology, which utilizes a three dimensional infrared laser projector and a monochrome CMOS sensor for analyzing depth, as well as a separate RGB video camera. Details of such technology may be disclosed in U.S. Pat. Nos. 7,763,841

Amazon Ex. 1002.0050

titled OPTICAL COMPONENT FOR A DEPTH SENSOR and 6,963,060 titled PHOTO-SENSOR ARRAY FOR MOTION DETECTION, the disclosures of which are incorporated herein by reference. However, it should be understood that alternative three dimensional spatial motion sensor technology may be employed with sensor 423. Still further, sensor 423 may include a camera that is additionally utilized to record and/or review activities by an individual being guided by guide system, such as camera 313 of guide system 300 of FIG. 7. Accordingly, it should be appreciated that the sensor 423 of guide system may be used for process analysis purposes, remote user interface and/or programming purposes, as well as for confirmation of proper completion of guided operations.

[0099] FIG. 7 illustrates an operational guide system 500, which may be any of guide systems 10, 200, 300 or 400 described above, in operation simultaneously providing indicating lights to guide activities of multiple individuals 512a, 512b, 512c, 512d. As illustrated, guide system 500 includes a single controller 520 with multiple projectors 566a, 566b, 566c, 566d and multiple sensor apparatuses 526a, 526b, 526c, 526d. Each projector 566 may be used to guide one or more actions by a separate individual 512, where the actions for each individual 512 may be guided completely separate or independently of the guiding of actions for the other individuals. For example, if each individual 512 is performing the same task, but each individual performs the task at a different rate, guide system 500 can accommodate such variation and allow each individual to initiate, perform, and finalize their activities separately from one another. Alternatively, one or more of the individuals 512 may be directed by guide system 500 to perform separate tasks requiring different guided activities that may be initiated, performed, and completed independently from the guided activities for the other individuals. Accordingly, operational guide system 500 may be provided with, as shown, separate sensor apparatuses 526a, 526b, 526c, 526d and/or confirmation modules 528a, 528b, 528c, 528d associated with each individual 512a, 512b, 512c, 512d, respectively. Furthermore, these system improvements may also be used by guide system 500 to project the VDFs required to guide process steps for multiple individuals from one projector rather than multiple projectors.

[00100] Operational guide systems 200, 300 and 400 of FIGS. 3-6 may be similarly constructed to operational guide system 10 discussed above, with similar components to operational guide system 10 being identified with 200, 300 and 400 added to the reference

Amazon Ex. 1002.0051

numerals of guide system 10, and such that not all of the details of similar features are discussed with reference to guide systems 200, 300 and 400.

[00101] In addition, guide systems in accordance with the present invention may include a conditional programming methodology whereby the guide system controller enables and/or provides a user, system controller, or manufacturing execution system to re-direct the guide system based on a signal received by the guide system controller. For example, if a sensor apparatus detects that a guided operation was missed or not done properly, the guide system may provide specific remedial guidance based on that detection. Examples include, but are not limited to, rework requirements, help information, and missing parts options. If, for example, a vision system sensor detects that a part is missing or a gauge tool sensor detects that a part is out of specification, guide system may provide remedial guided actions to correct the error.

[00102] The guide system of the present invention thus is readily programmable and adaptable to provide a cost effective and accurate method of guiding an individual through a series of tasks and/or provide confirmation that the tasks have been properly completed.

[00103] Changes and modifications in the specifically described embodiments can be carried out without departing from the principles of the present invention which is intended to be limited only by the scope of the appended claims, as interpreted according to the principles of patent law including the doctrine of equivalents.

Amazon Ex. 1002.0052

CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method of projecting visual indicators onto a physical object to guide actions of an individual, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of addressed display features;

providing an input signal to said guide system controller;

selecting an addressed display feature based on said input signal; and

projecting a visual indicator corresponding to said selected addressed display feature onto a physical object.

2. The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting a positional identifier based on said input signal, and wherein said projecting a visual indicator further comprises projecting a visual indicator corresponding to said selected addressed display feature onto a physical object at a location corresponding to said selected positional identifier.

3. The method of claim 1 or 2, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution system.

4. The method of claim 3, wherein said manufacturing execution system receives a signal from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signal received by said manufacturing execution system from said sensor apparatus.

Amazon Ex. 1002.0053

5. The method of claim 1 or 2, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller.

6. The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. The method of claim 1, wherein said visual indicator comprises at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on said visual indicator.

11. The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator, and wherein said method comprises recording images while an operator is guided by said guide system.

Amazon Ex. 1002.0054

13. The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers;

said guide system controller receiving an input signal with said guide system controller causing said directional light device to project a visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal.

16. The guide system of claim 15, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution system.

17. The guide system of claim 15, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller.

18. The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

Amazon Ex. 1002.0055

19. The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator.

22. The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

a guide system controller;

a projector, said projector being selectively operable to project and target a visual indicator; and

a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator;

said guide system controller receiving an input signal with said guide system controller causing said projector to project a visual indicator onto a physical object based on said input signal and with said guide system controller recording images and time durations while an individual is guided by said visual indicator.

Amazon Ex. 1002.0056

25. The guide system of claim 24 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

26. The guide system of claim 25, wherein said guide system controller includes a plurality of programmed addressed display features and a plurality of programmed positional identifiers, and wherein said guide system controller causes said projector to project said visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal.

27. The guide system of claim 24 further comprising a motion sensor, said motion sensor detecting three dimensional spatial motion.

28. The guide system of claim 27 wherein said motion sensor outputs a confirmation signal when the three dimensional spatial motion detected by said motion sensor complies with a desired action.

29. A guide system adapted to provide visual indicators to an individual to guide sequential actions, said guide system comprising:

an operational guide system comprising:

a directional light device, said directional light device being selectively operable to project and target at least one indicating light to produce a visual indicator;

a controller, said controller receiving input signals and selectively providing command signals to said directional light device in response to said input signals wherein the projection of said indicating light is indicative of said command signal; and

a manufacturing execution system interfaced with said operational guide system, said manufacturing execution system operable to provide data inputs to said operational guide system, said data inputs comprising input signals to said controller.

Amazon Ex. 1002.0057

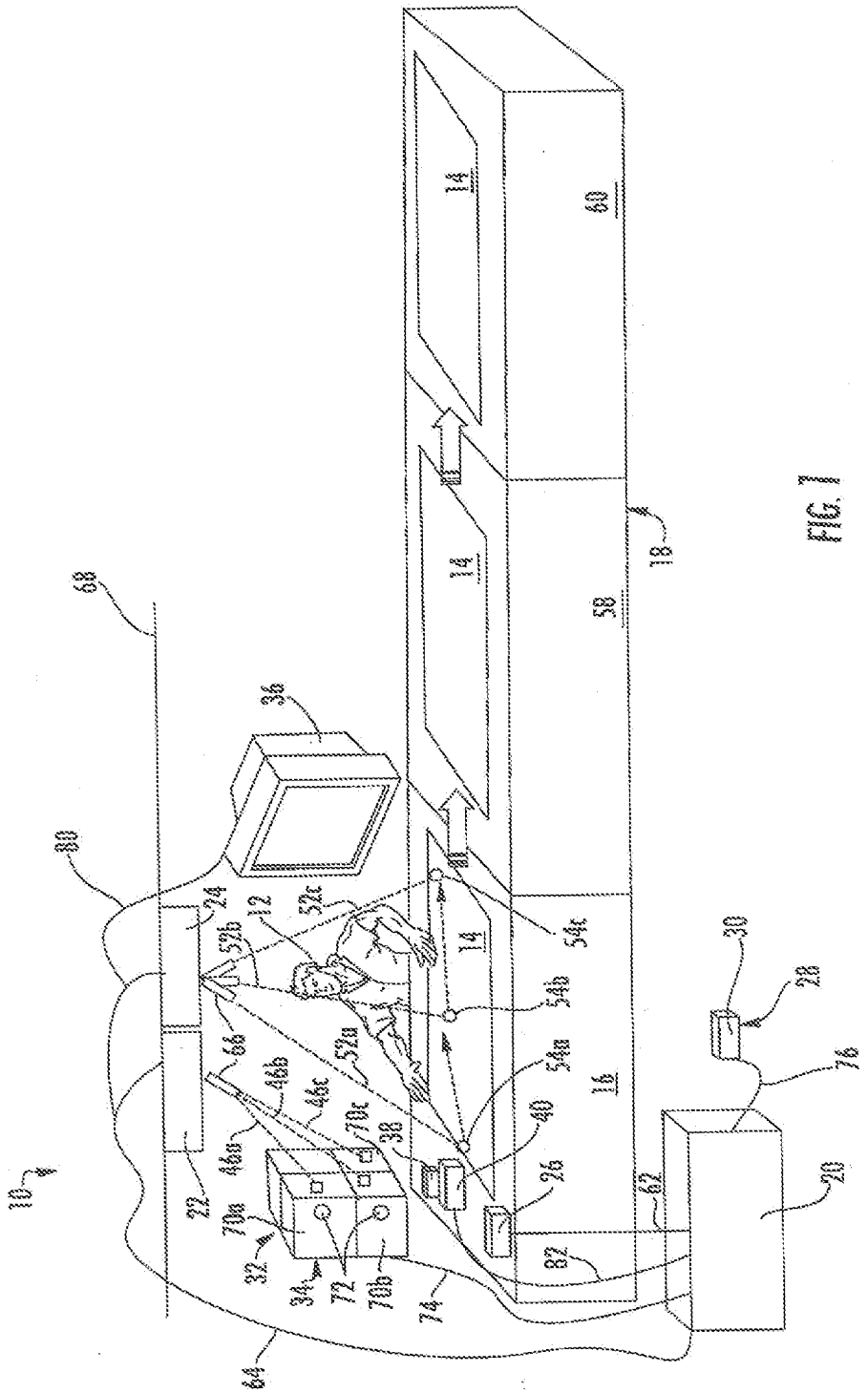


FIG. 1

Prior Art

Pre-assemble

> <

FIG. 1A

Select

FIG. 1B

Insert

FIG. 1C

Assemble

FIG. 1D

Pick

FIG. 1E

Gauge

FIG. 1F

Torque

FIG. 1G

Left

FIG. 1H

Right

FIG. 1I

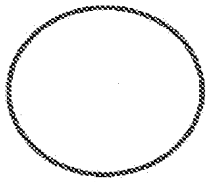


FIG. 1J

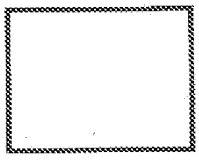


FIG. 1K

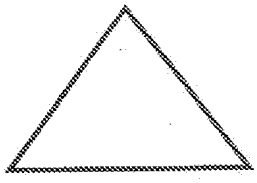


FIG. 1L

Prior Art

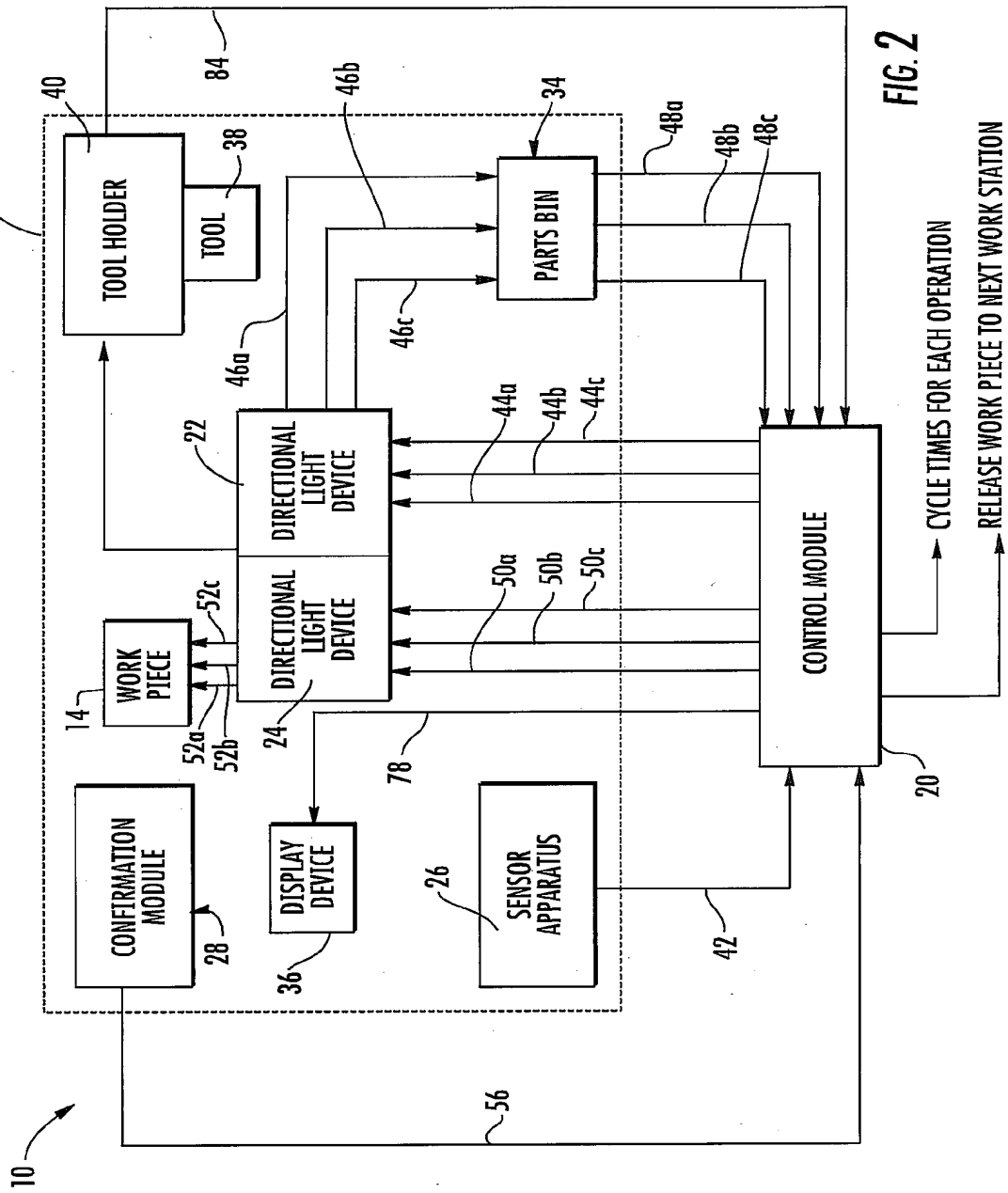


FIG. 2

Prior Art

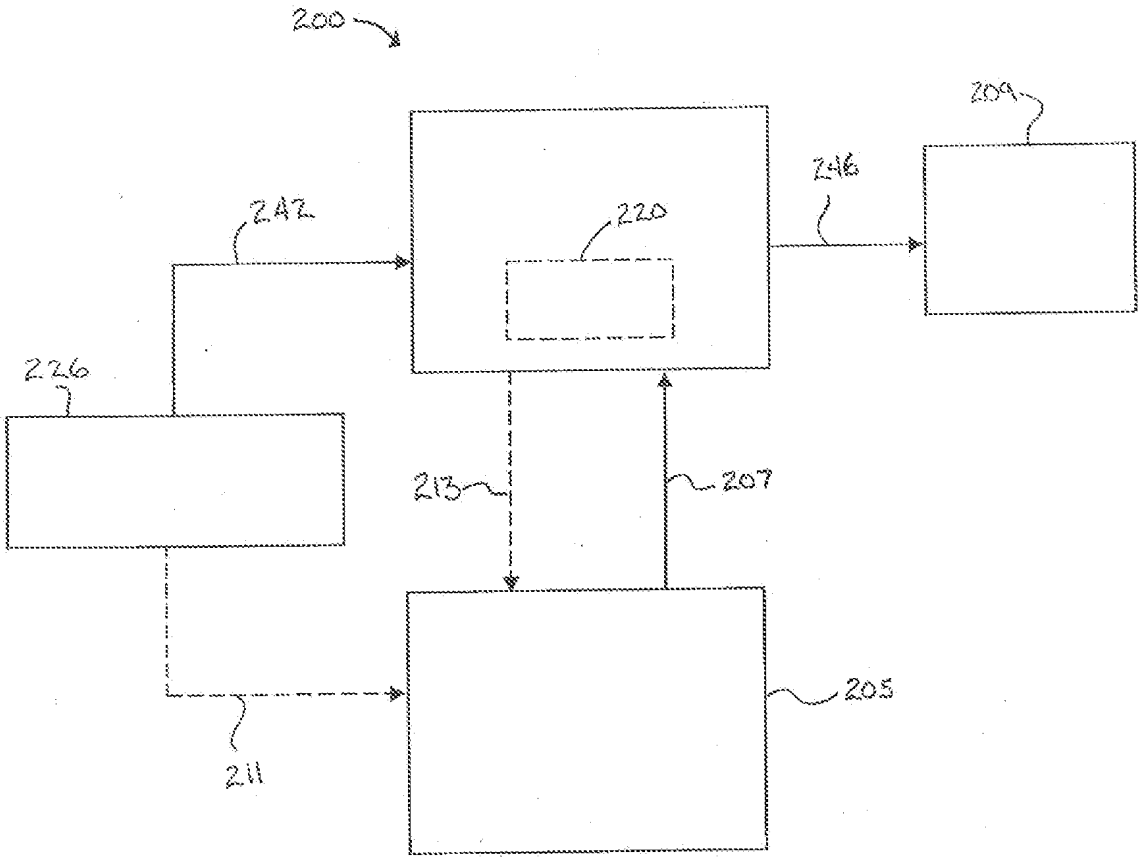


FIG. 3

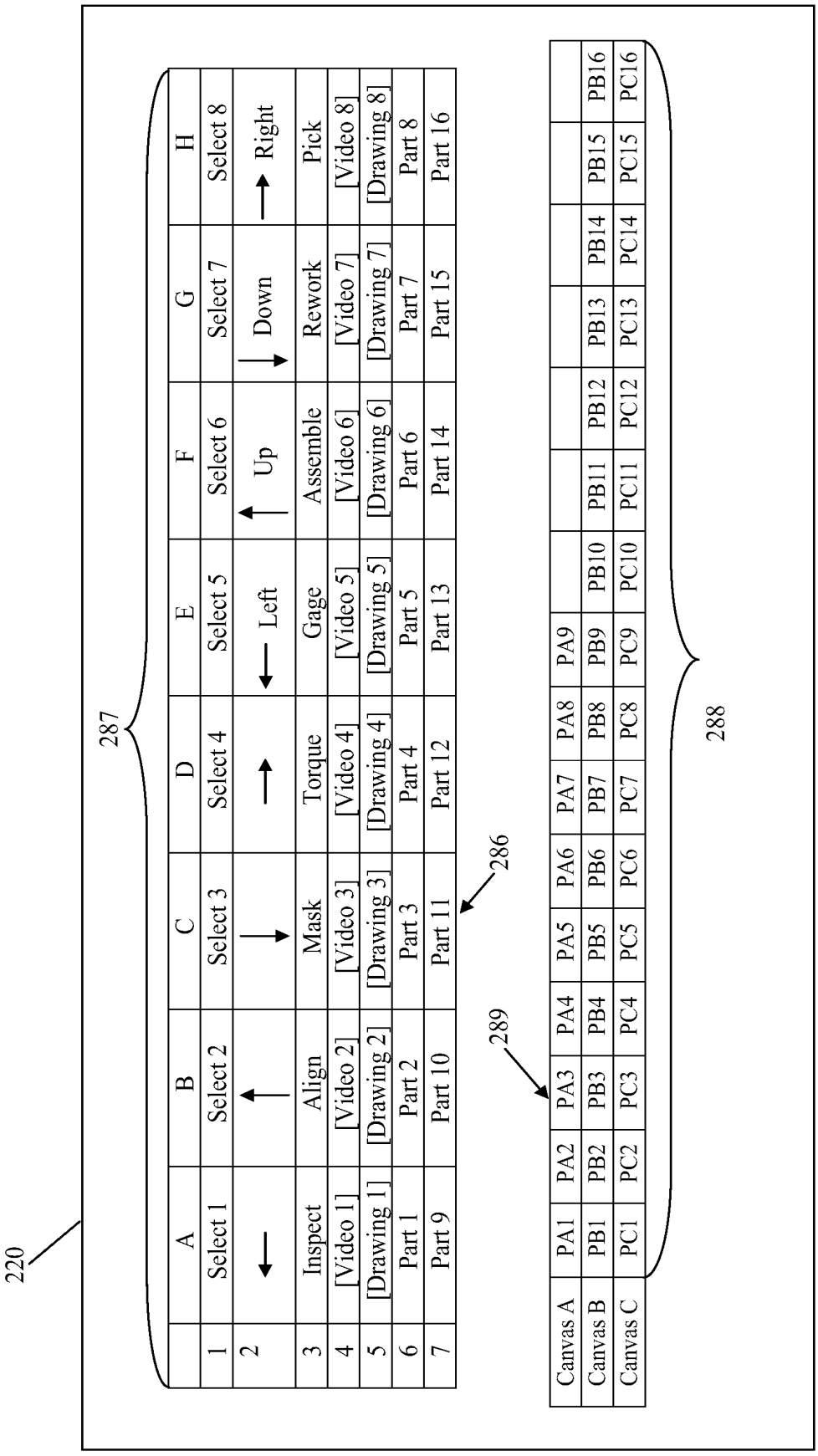

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A B C D E F G H
1 Select 1 Select 2 Select 3 Select 4 Select 5 Select 6 Select 7 Select 8
2 ← → ← → ← Left ↑ Up ↓ Down → Right
3 Inspect Align Mask Torque Gage Assemble Rework Pick
4 [Video 1] [Video 2] [Video 3] [Video 4] [Video 5] [Video 6] [Video 7] [Video 8]
5 [Drawing 1] [Drawing 2] [Drawing 3] [Drawing 4] [Drawing 5] [Drawing 6] [Drawing 7] [Drawing 8]
6 Part 1 Part 2 Part 3 Part 4 Part 5 Part 6 Part 7 Part 8
7 Part 9 Part 10 Part 11 Part 12 Part 13 Part 14 Part 15 Part 16
Canvas A PA1 PA2 PA3 PA4 PA5 PA6 PA7 PA8 PA9
Canvas B PB1 PB2 PB3 PB4 PB5 PB6 PB7 PB8 PB9 PB10 PB11 PB12 PB13 PB14 PB15 PB16
Canvas C PC1 PC2 PC3 PC4 PC5 PC6 PC7 PC8 PC9 PC10 PC11 PC12 PC13 PC14 PC15 PC16

FIG. 3A

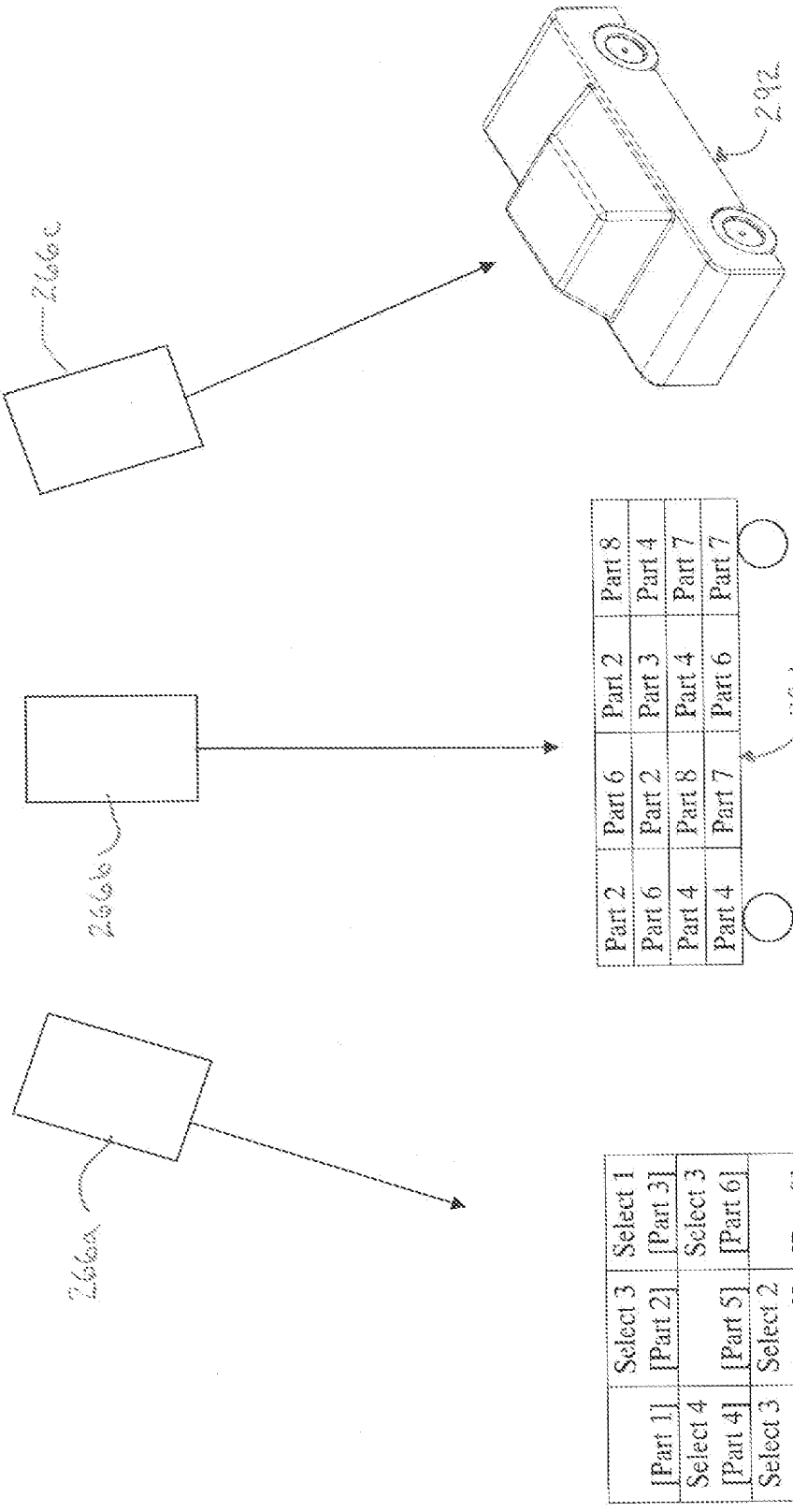

292
266c
266b
266a
Part 2 Part 6 Part 2 Part 8
Part 6 Part 2 Part 3 Part 4
Part 4 Part 8 Part 4 Part 7
Part 4 Part 7 Part 6 Part 7
294
Select 3 [Part 2] Select 1 [Part 3]
[Part 1] Select 3 [Part 6]
Select 4 [Part 4] [Part 5] Select 2 [Part 8] [Part 9]
Select 3 [Part 7]
290

FIG. 3B

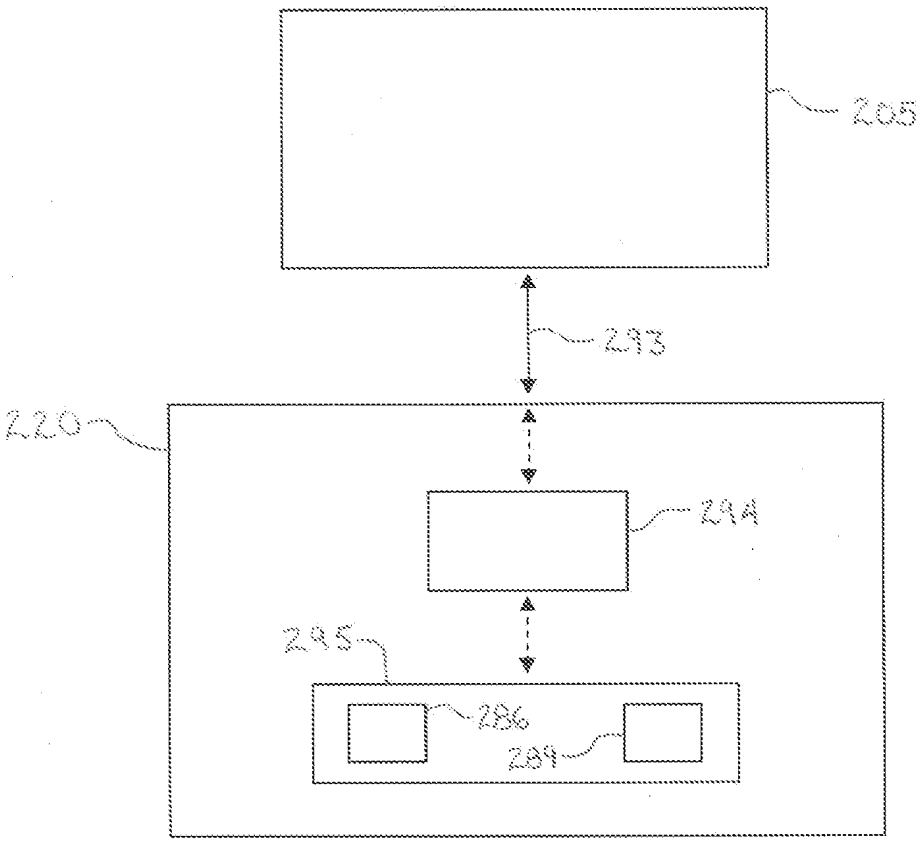


FIG. 3C

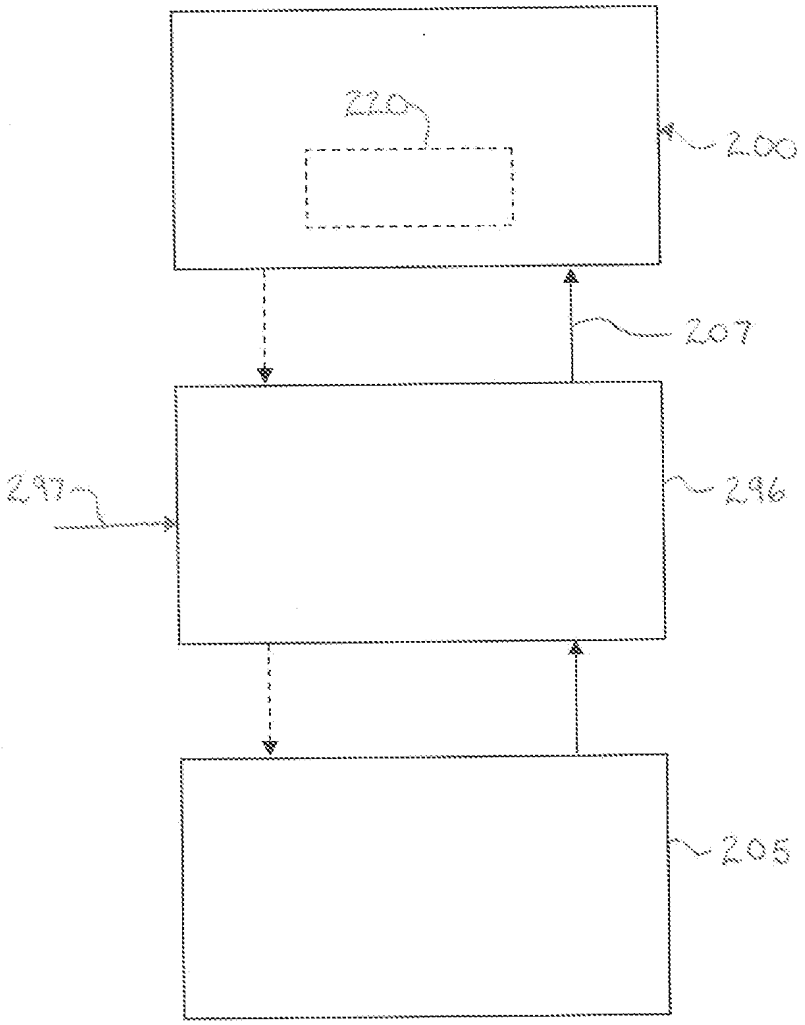


FIG. 3D

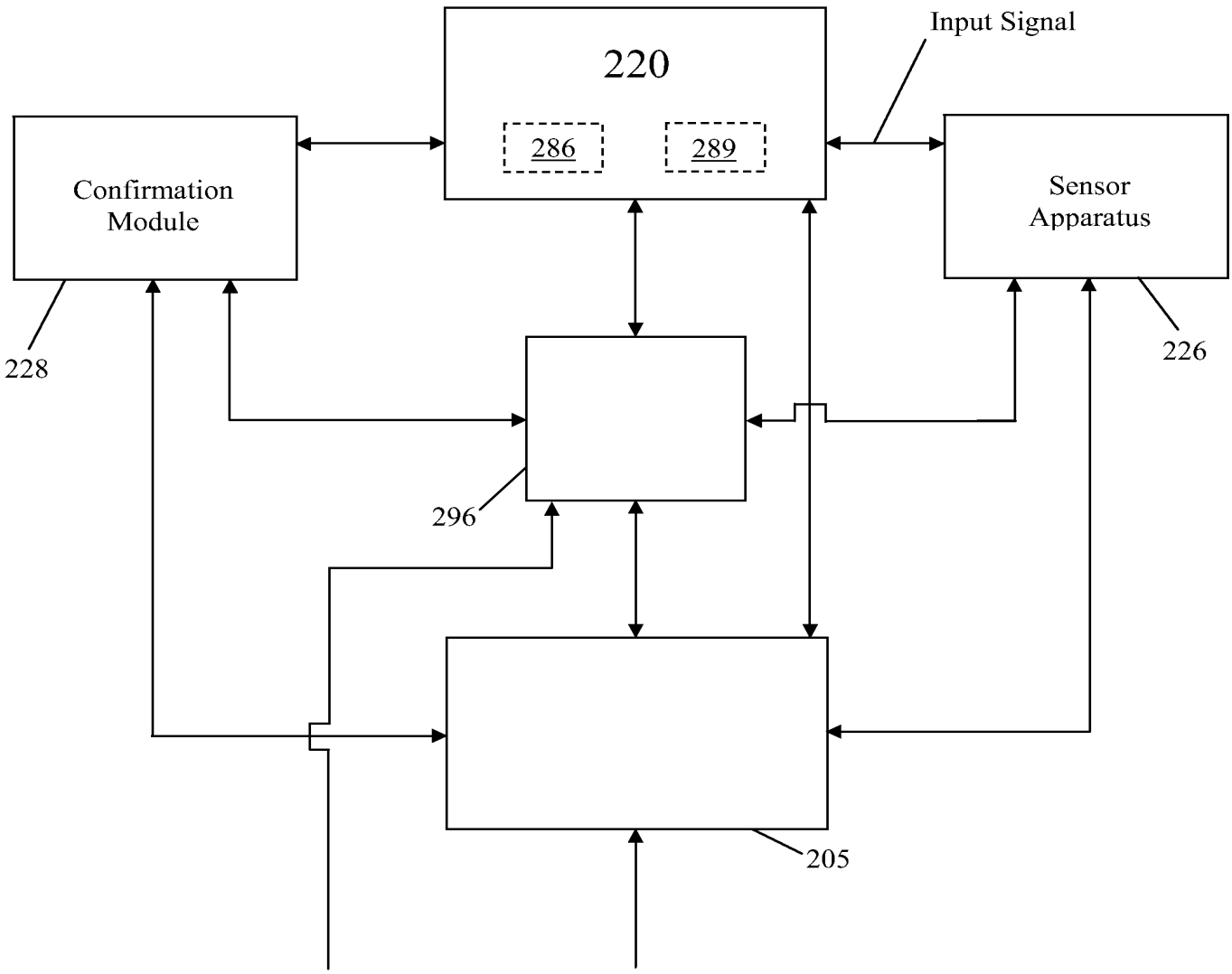

220
286
289
Input Signal
Confirmation Module
Sensor Apparatus
228
226
296
205

FIG. 3E

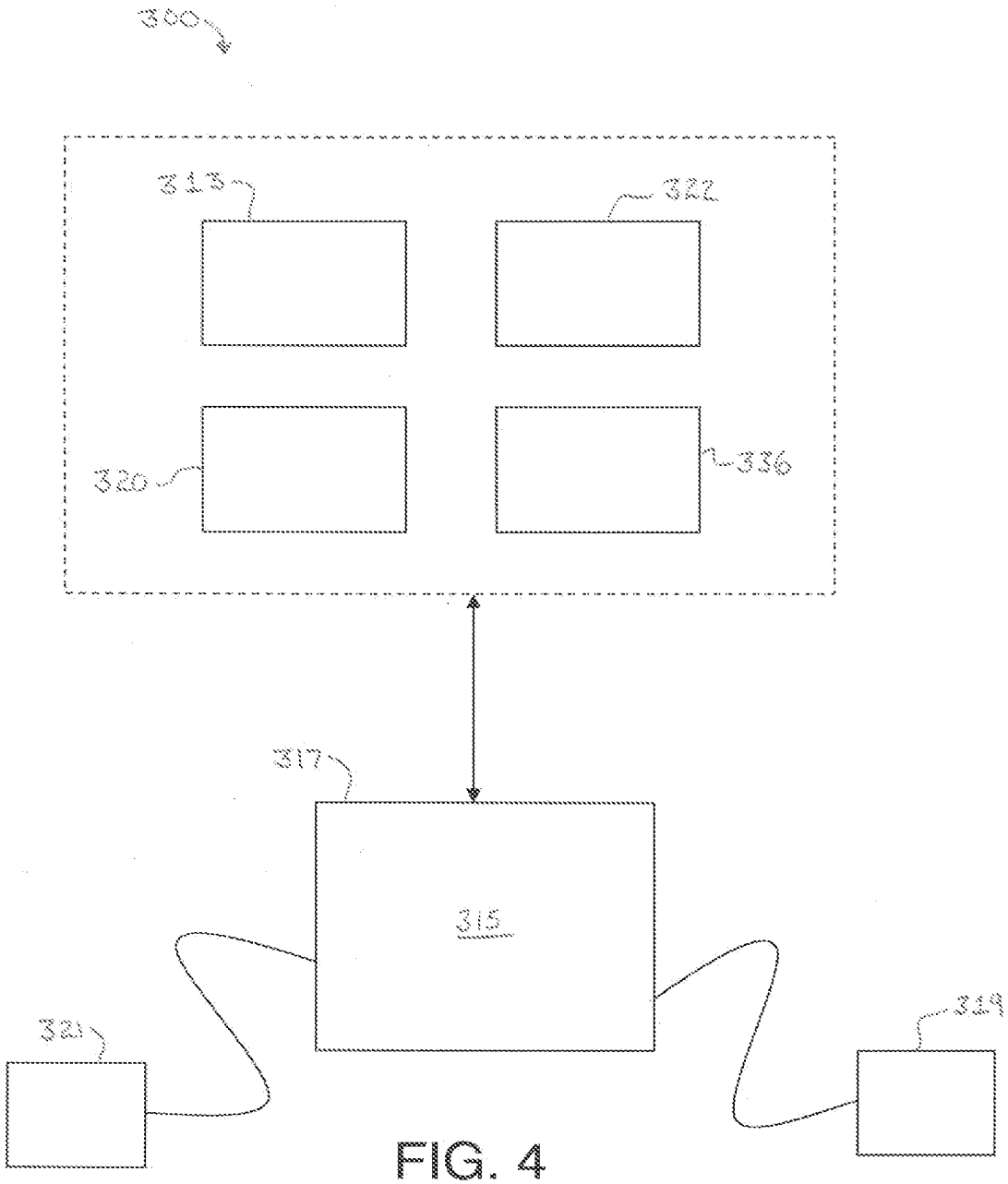


FIG. 4

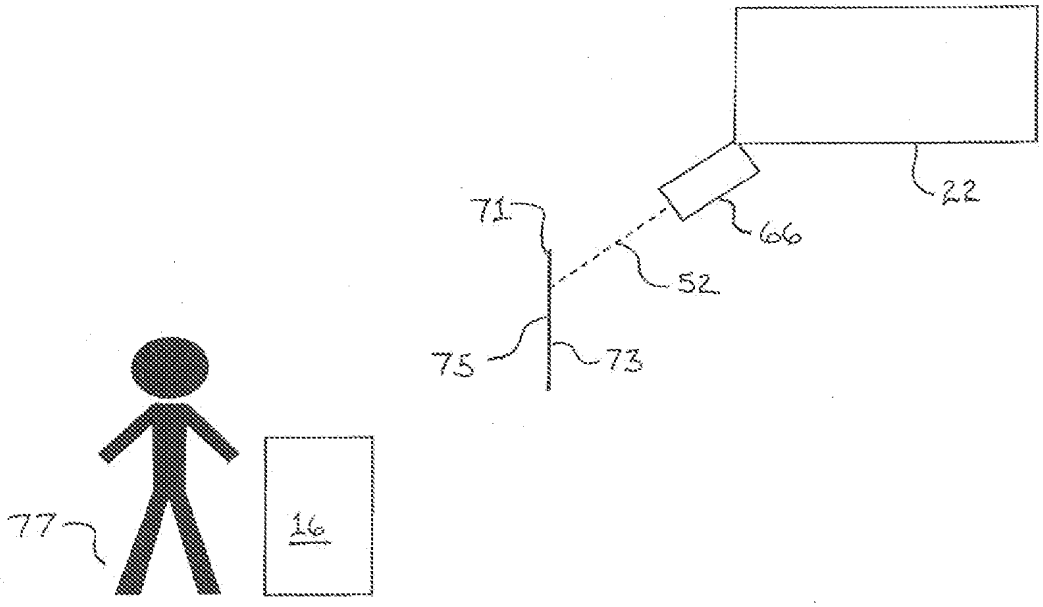


FIG. 5A

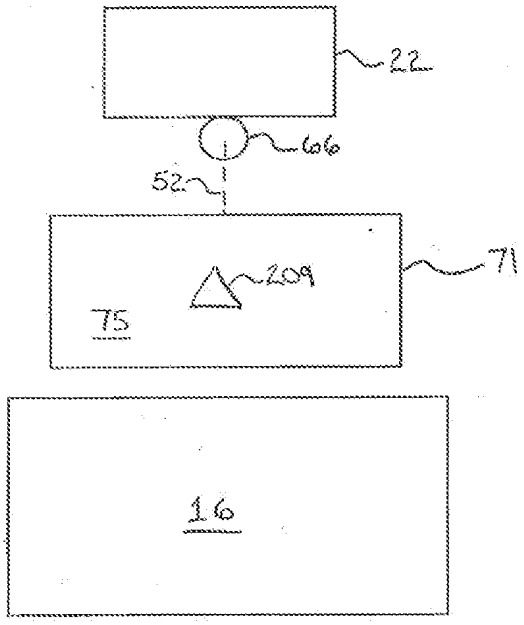


FIG. 5B

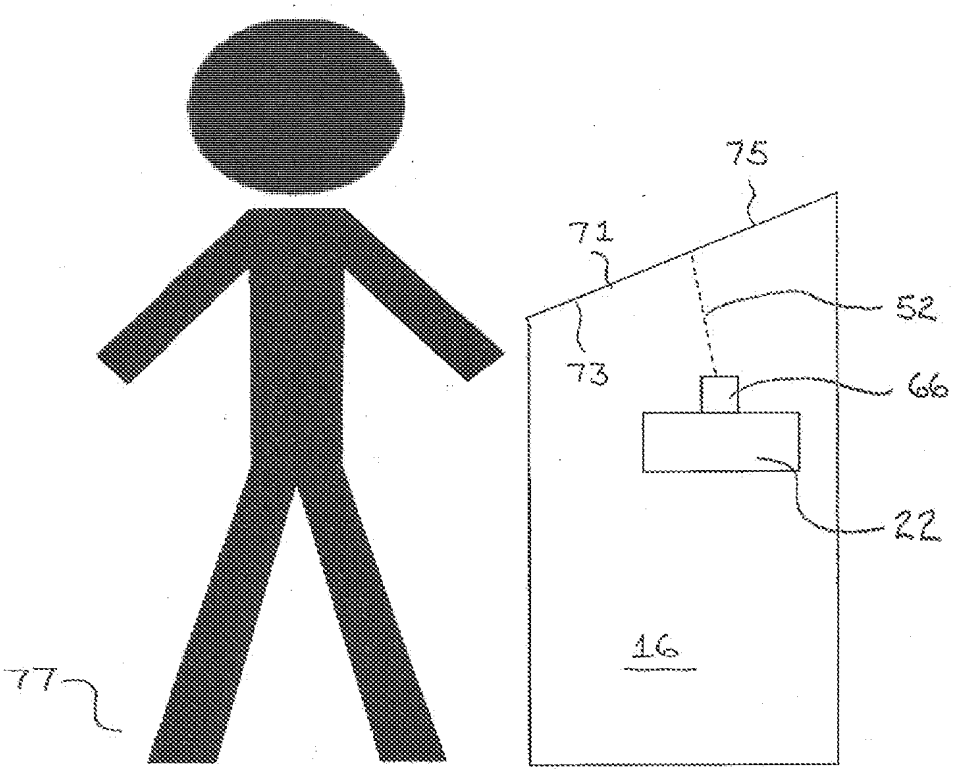


FIG. 5C

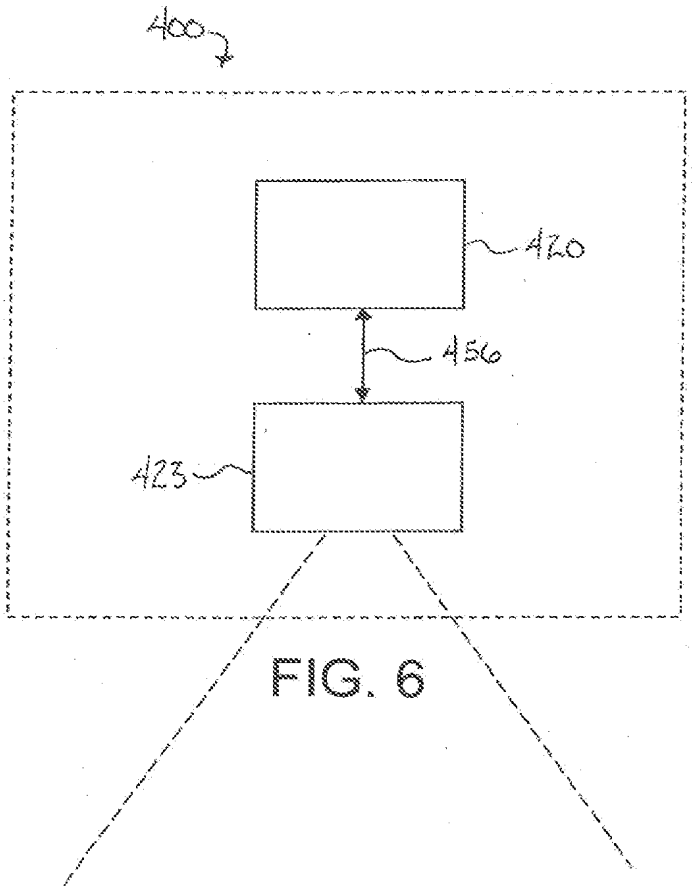
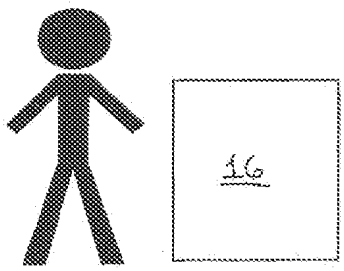


FIG. 6



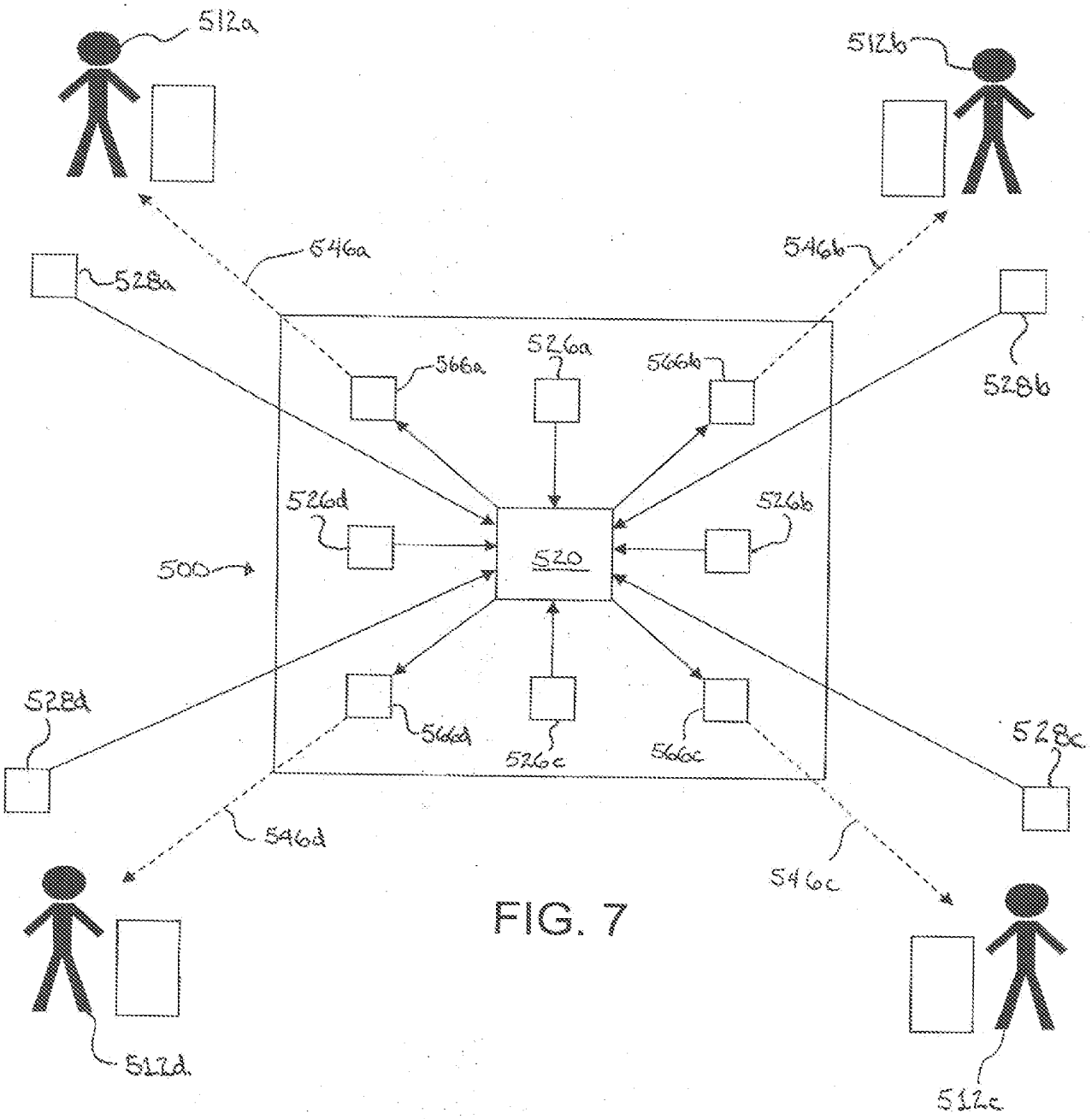

512a
512b
546a
546b
528a
528b
526a
566a
566b
526d
526b
500
520
528d
528c
566d
526c
566c
546d
546c
512d
512c

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/024730

A. CLASSIFICATION OF SUBJECT MATTER

G01C 15/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G01C 15/02; G01C 15/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: project, indicator, light, guide

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006-0059699 A1 (NORMAN L. KRANTZ) 23 March 2006 See paragraph [0021] - paragraph [0047]; abstract and figures 1-10.	1-29
A	US 2004-0111901 A1 (RONALD E. NEWCOMER) 17 June 2004 See paragraph [0017] - paragraph [0024]; abstract and figures 1-7.	1-29
A	US 2006-0185181 A1 (CHARLES LONG et al.) 24 August 2006 See abstract and figures 1-6.	1-29

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 JUNE 2012 (14.06.2012)	**02 JULY 2012 (02.07.2012)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer PARK, TAE WOOK Telephone No. 82-42-481-8420

Form PCT/ISA/210 (second sheet) (July 2009)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/024730

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2004-0111901 A1	17.06.2004	US 6772525 B2	10.08.2004
US 2006-0185181 A1	24.08.2006	CA 2512789 A1	17.02.2006
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		US 7174648 B2	13.02.2007
		US 7181854 B2	27.02.2007
		US 7191532 B2	20.03.2007
		US 7260895 B2	28.08.2007
		US 7322116 B2	29.01.2008

Amazon Ex. 1002.0073

PCT REQUEST

Original (for **SUBMISSION**)

VIII-4-1	**Declaration: Inventorship (only for the purposes of the designation of the United States of America)** Declaration of Inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America:	I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought. This declaration is directed to the international application of which it forms a part (if filing declaration with application). This declaration is directed to international application No. PCT/ . . . . . (if furnishing declaration pursuant to Rule 26ter). I hereby declare that my residence, mailing address, and citizenship are as stated next to my name. I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications", by application number, country or Member of the World Trade Organization, day, month, and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.
VIII-4-1-1	Prior applications:	61/441,897, US, 11 February 2011 (11.02.2011)

PCT REQUEST

Original (for **SUBMISSION**)

		I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.
VIII-4-1-1-1	Name (LAST, First)	RYZNAR, Paul
VIII-4-1-1-2	Residence: (city and either US State, if applicable, or country)	Northville, Michigan
VIII-4-1-1-3	Mailing address:	49601 Deer Run Drive Northville, MI 48167 United States of America
VIII-4-1-1-4	Citizenship:	US
VIII-4-1-1-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/paul ryznar/
VIII-4-1-1-6	Date:	10 February 2012 (10.02.2012)

PCT REQUEST

Original (for **SUBMISSION**)

VIII-4-1-2-1	Name (LAST, First)	RYZNAR, James
VIII-4-1-2-2	Residence: (city and either US State, if applicable, or country)	Belleville, Michigan
VIII-4-1-2-3	Mailing address:	11535 Ryznar Drive Belleville, MI 48111 United States of America
VIII-4-1-2-4	Citizenship:	US
VIII-4-1-2-5	Inventor's Signature: (The signature must be that of the inventor, not that of the agent)	/james ryznar/
VIII-4-1-2-6	Date	10 February 2012 (10.02.2012)

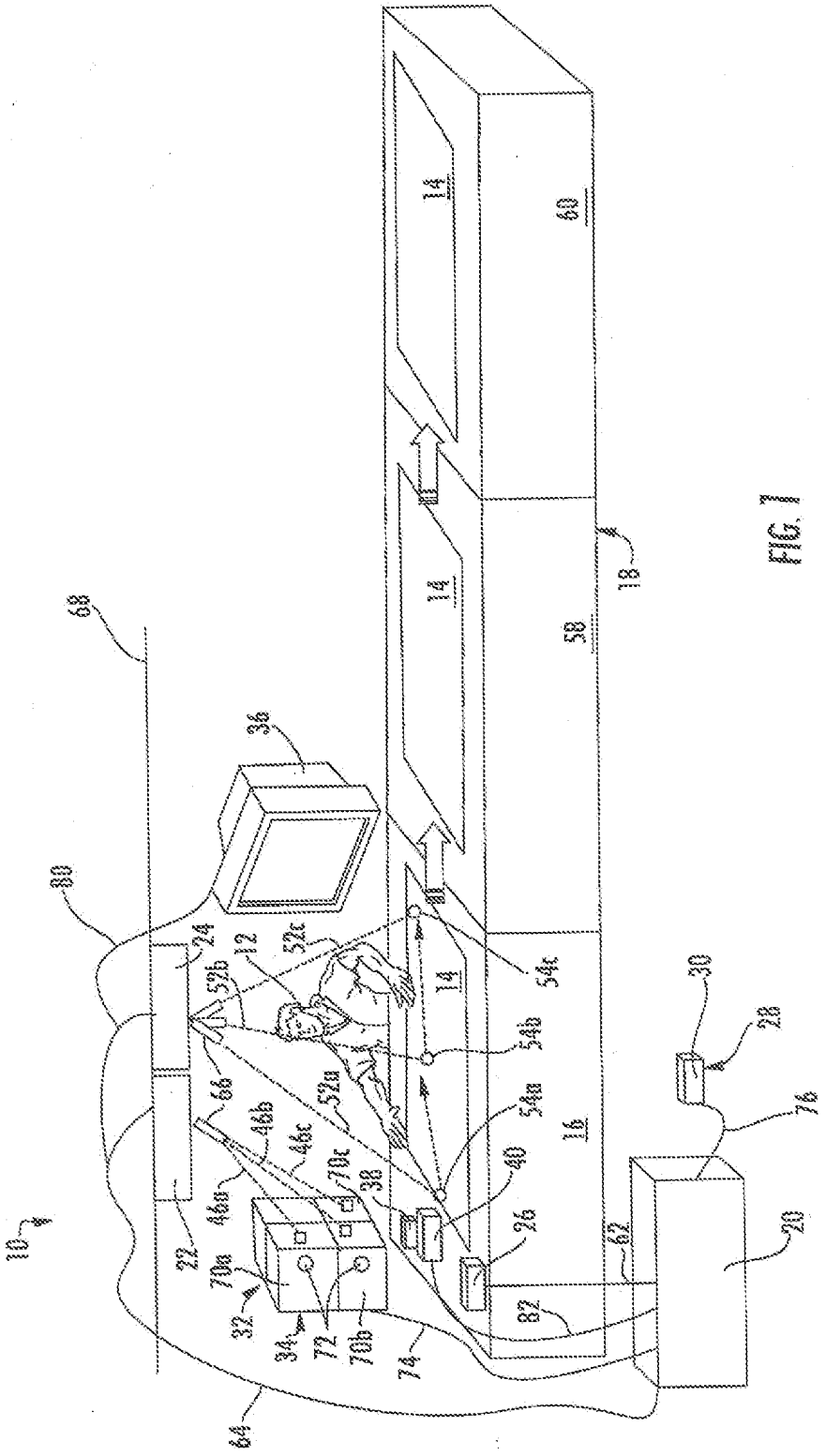


FIG. 1

Prior Art

Pre-assemble

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FIG. 1A

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FIG. 1B

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FIG. 1C

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FIG. 1D

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FIG. 1E

Gauge

FIG. 1F

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FIG. 1G

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FIG. 1H

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FIG. 1I

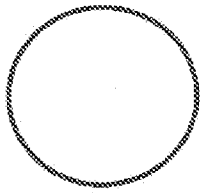


FIG. 1J

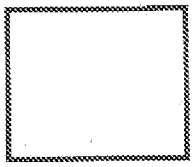


FIG. 1K

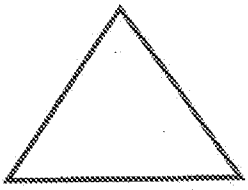


FIG. 1L

Prior Art

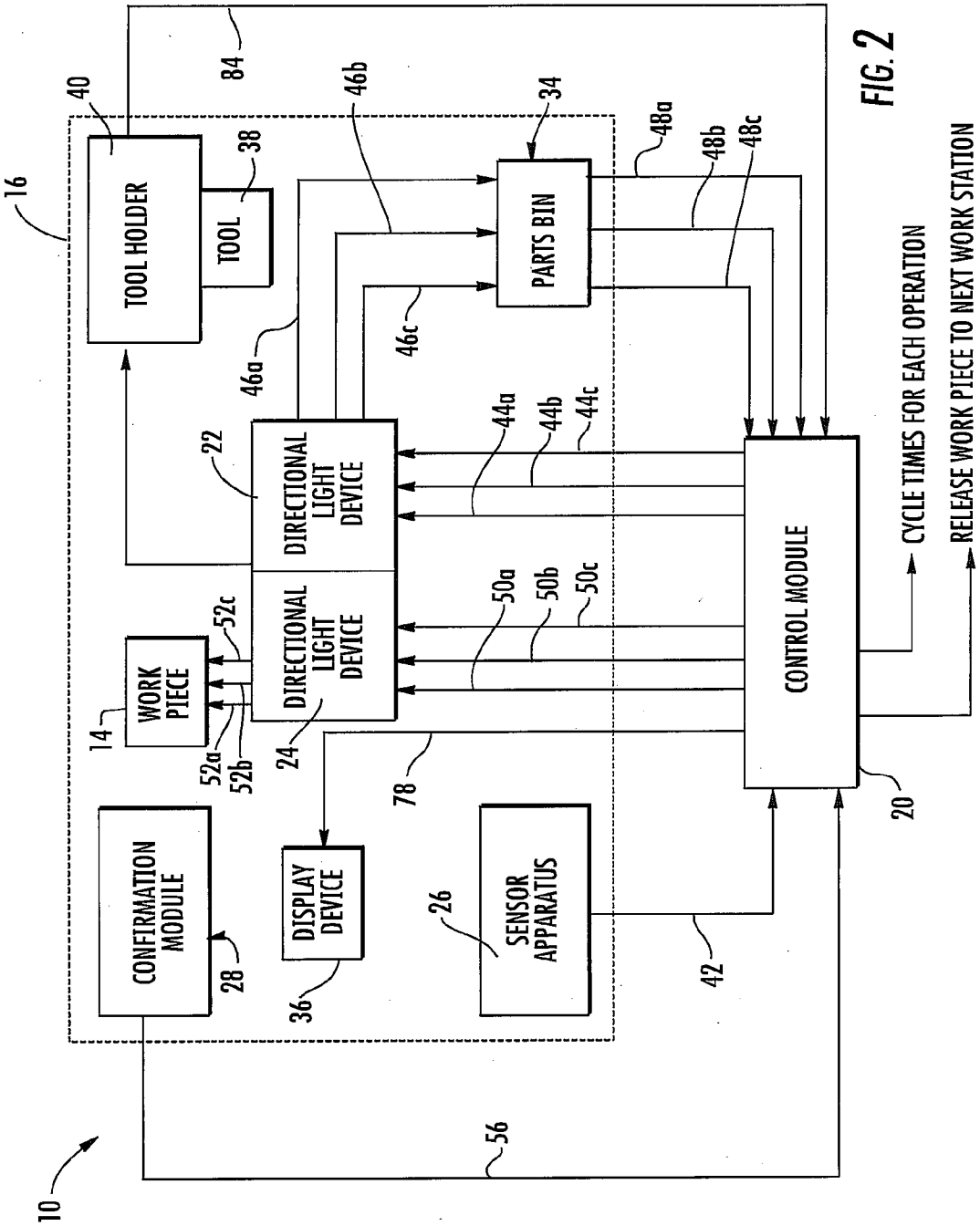


FIG. 2

Prior Art

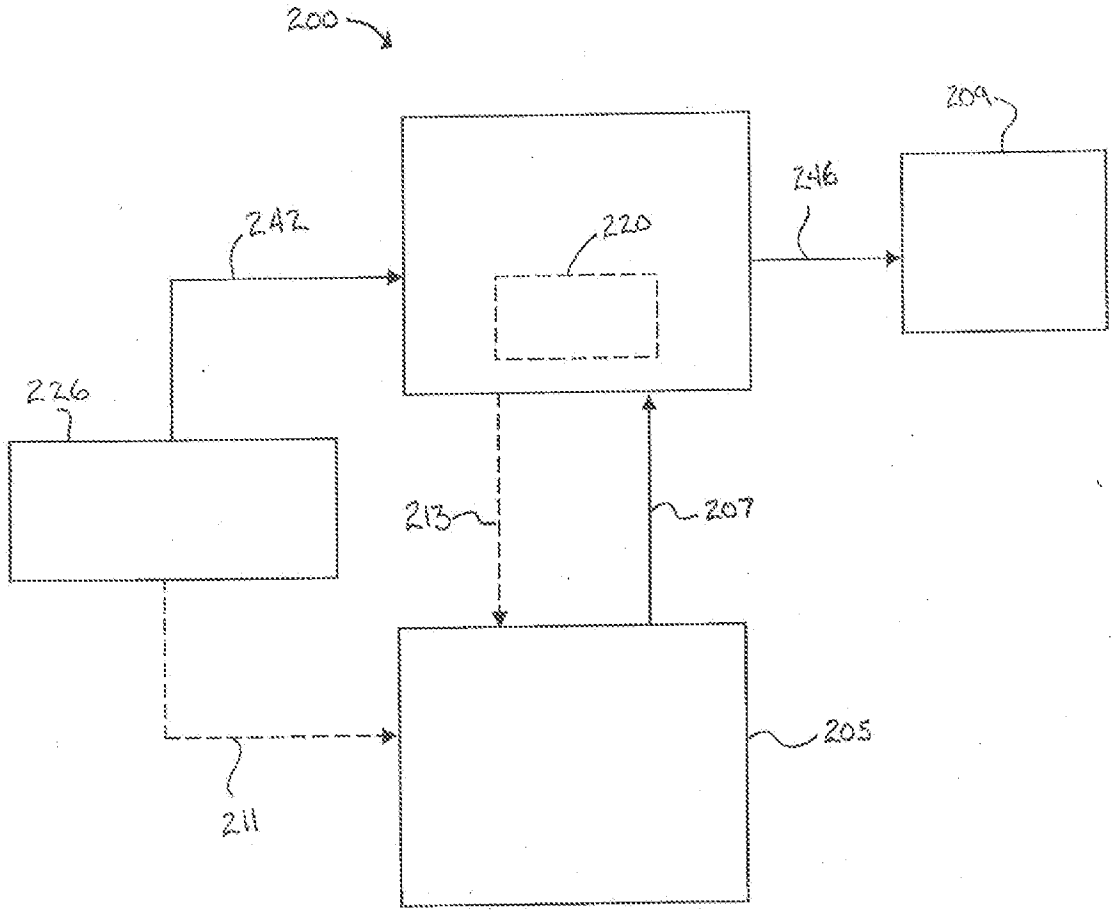


FIG. 3

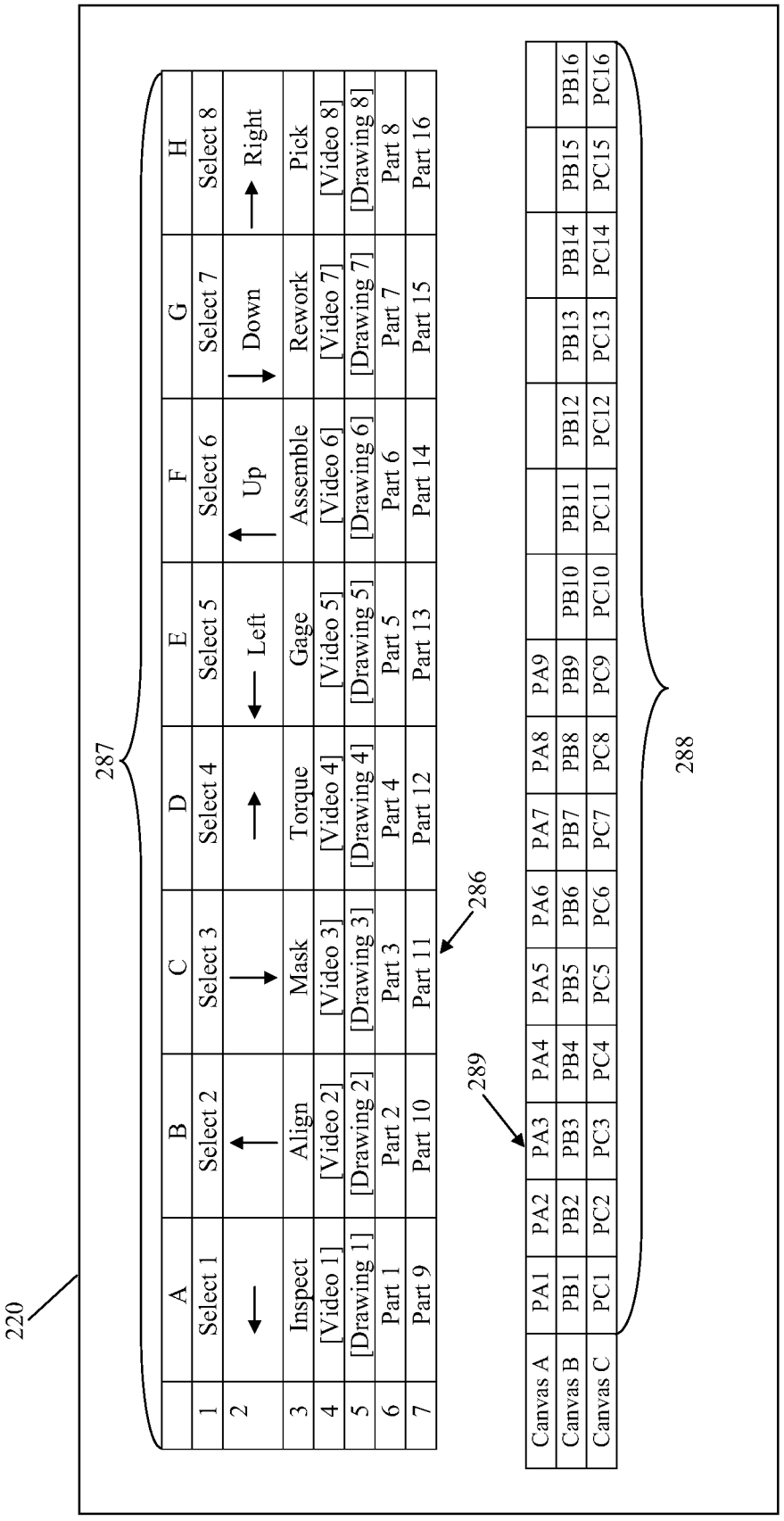

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FIG. 3A

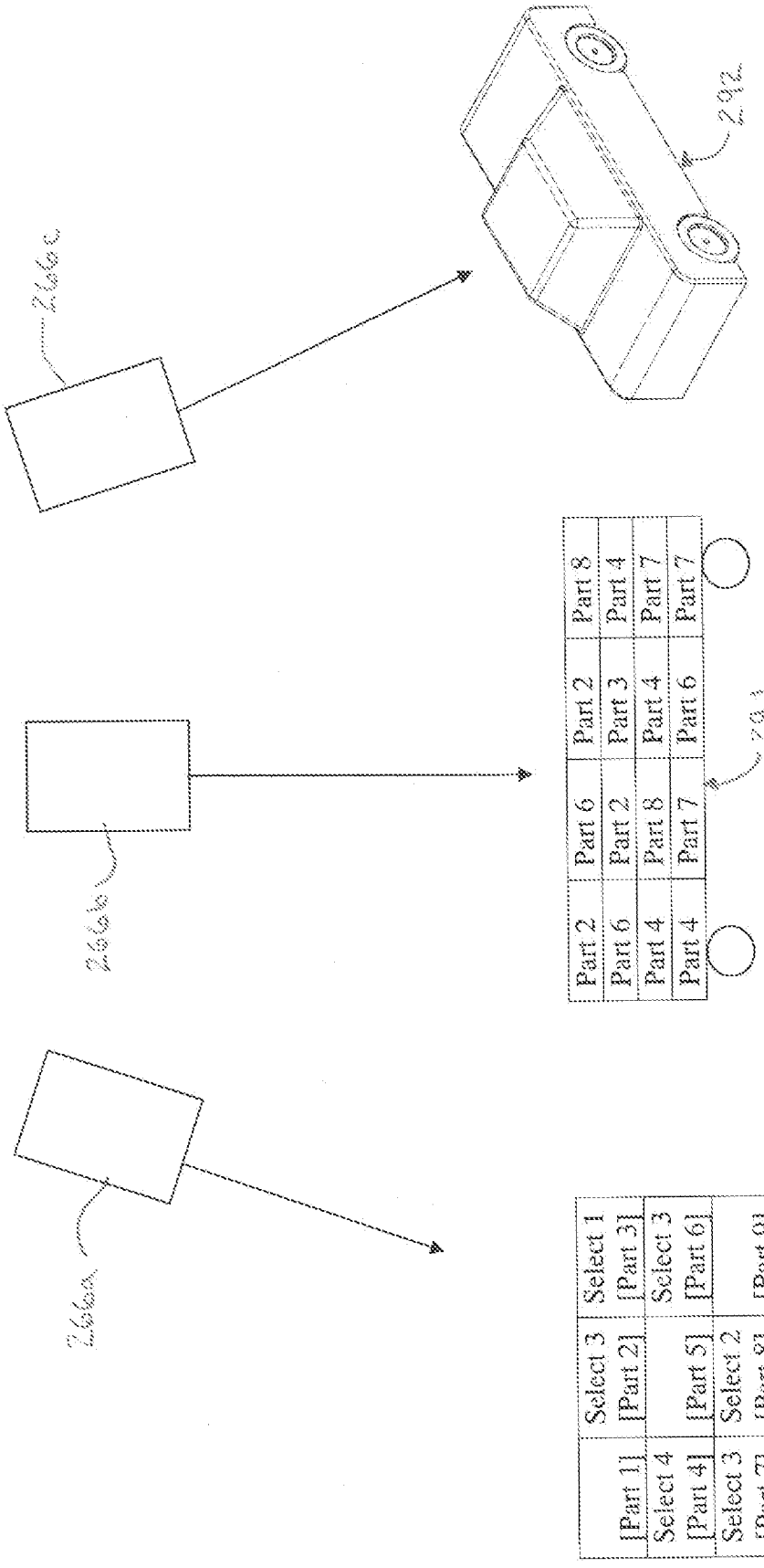

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FIG. 3B

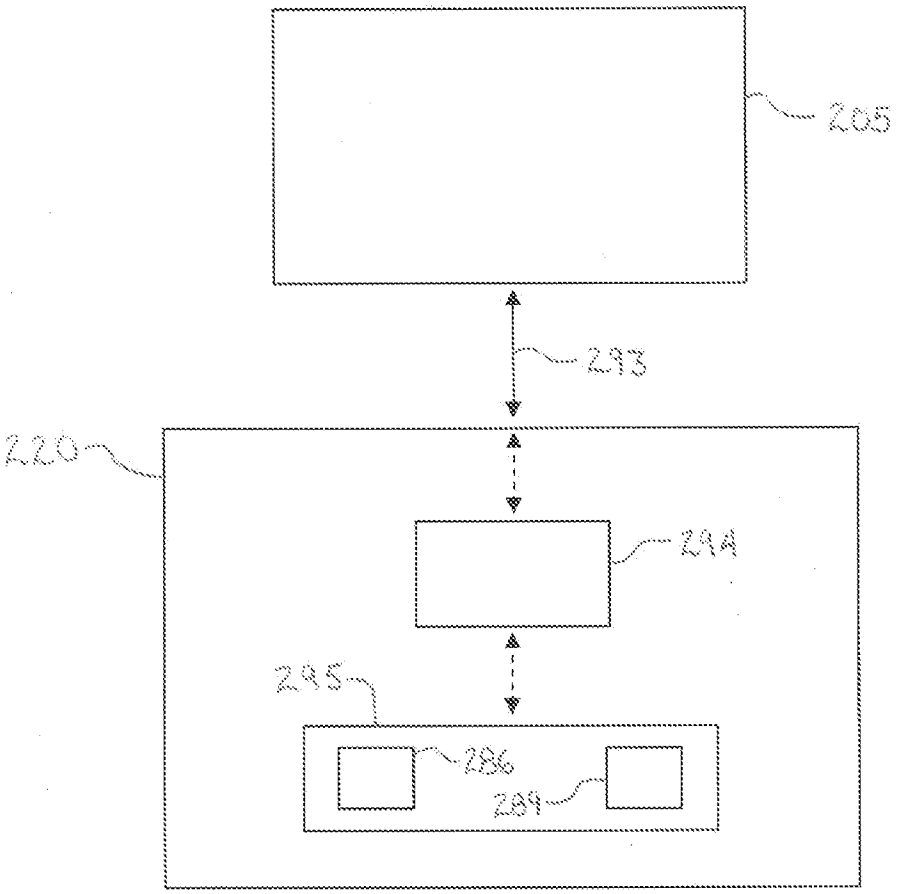


FIG. 3C

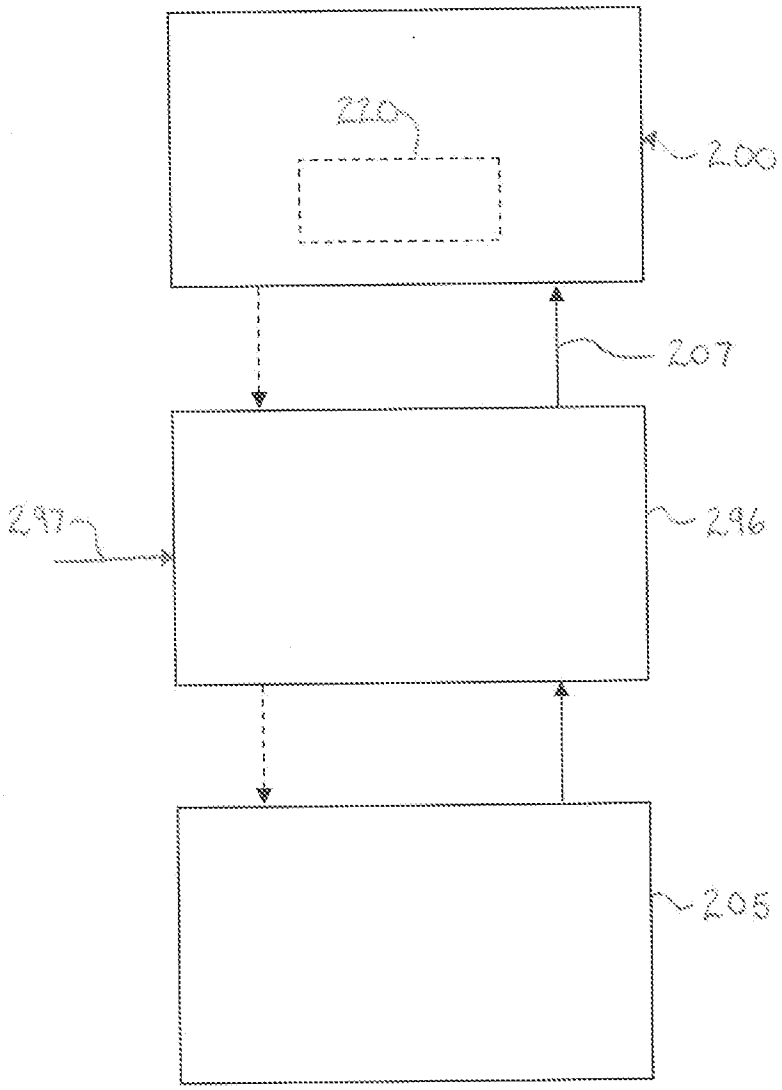


FIG. 3D

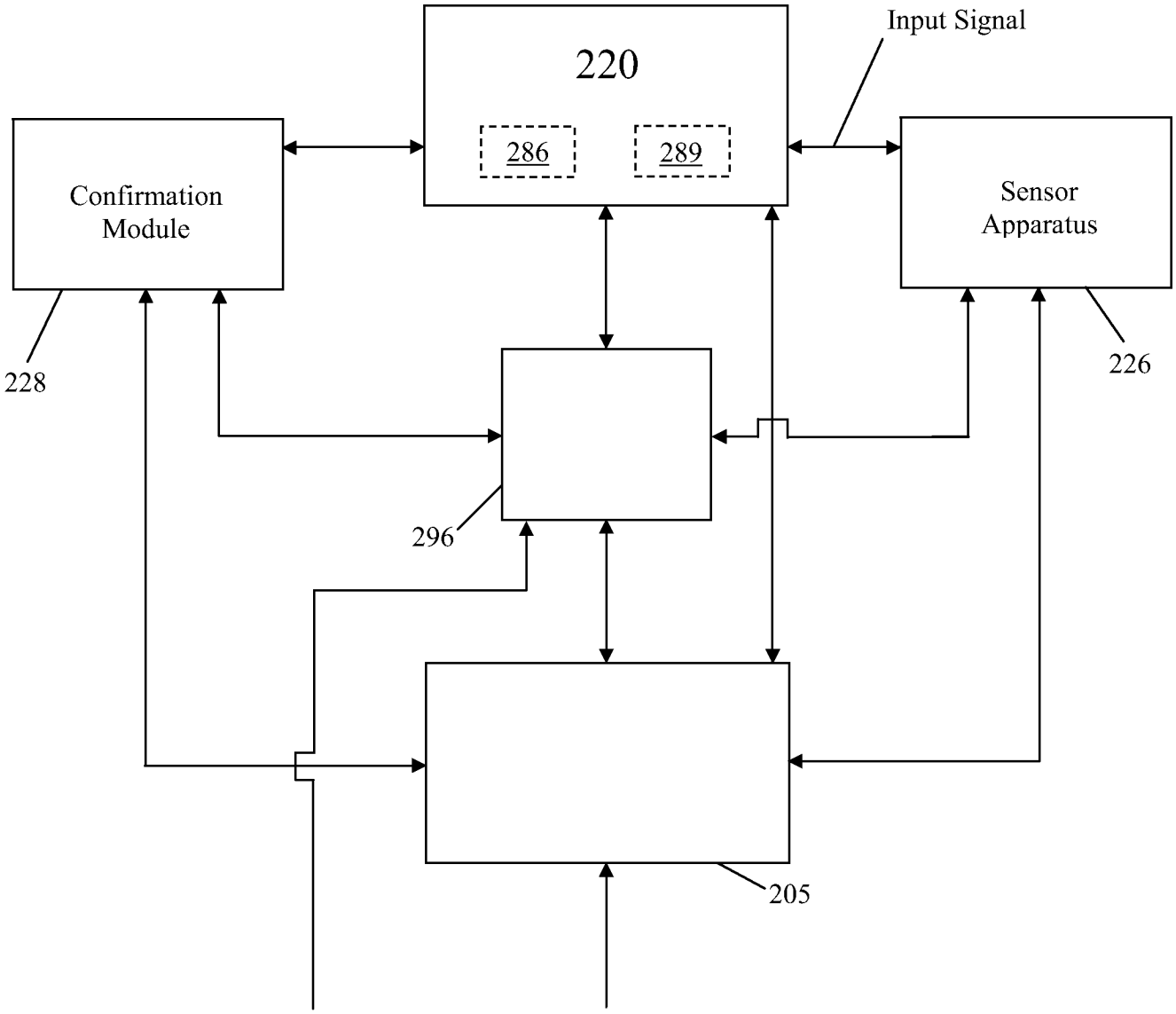

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Input Signal
Confirmation Module
Sensor Apparatus
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FIG. 3E

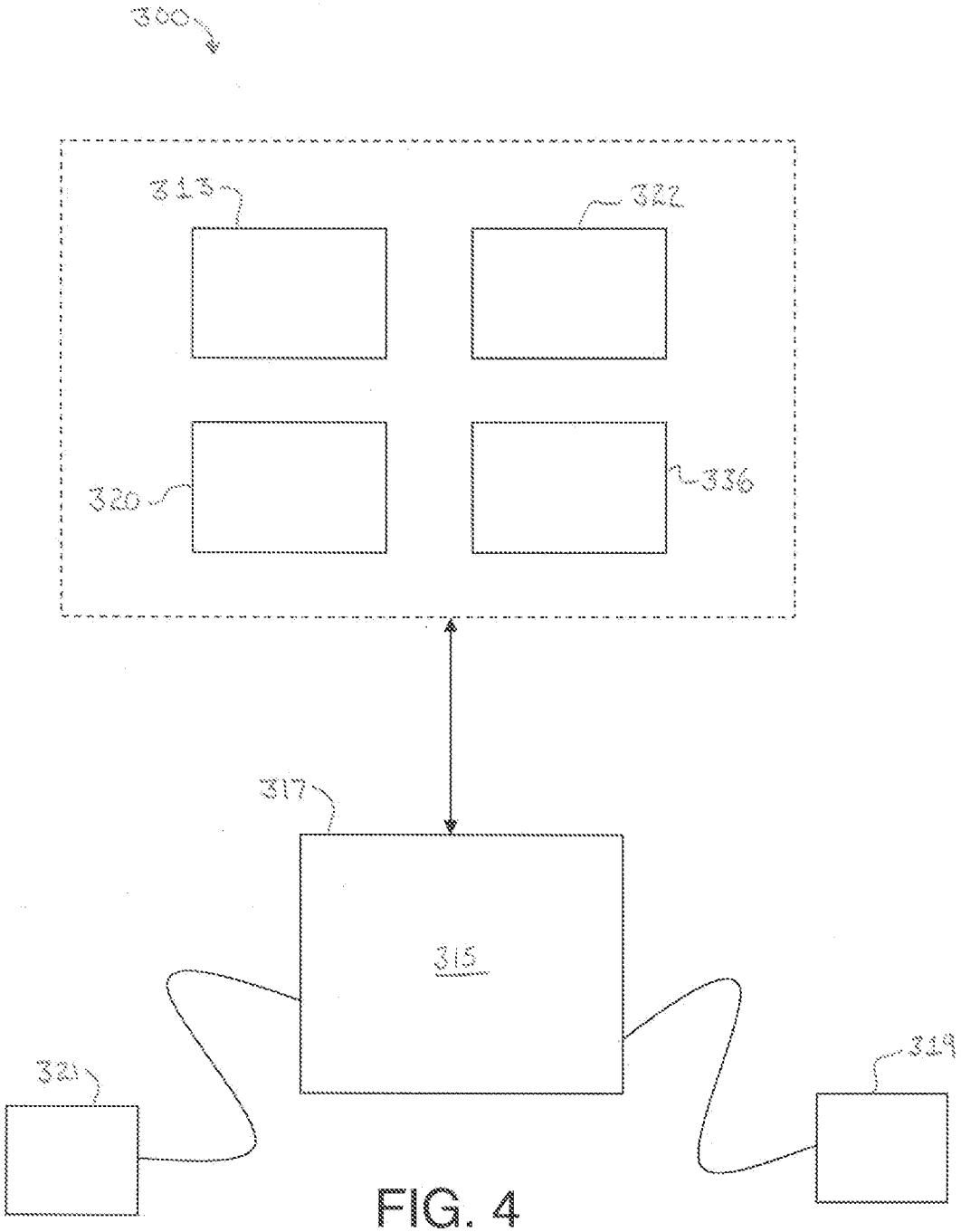


FIG. 4

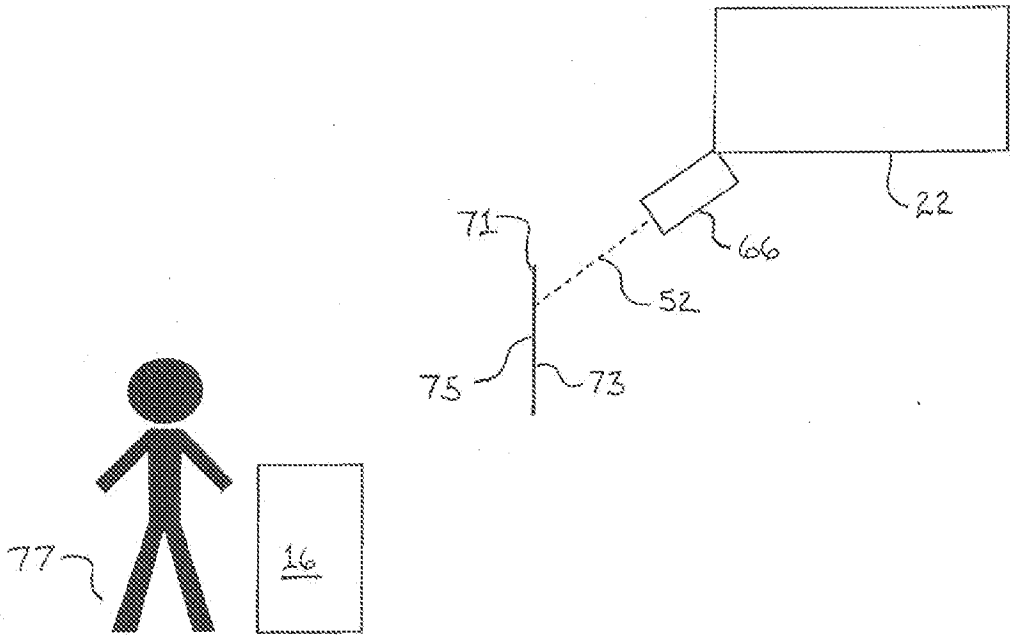


FIG. 5A

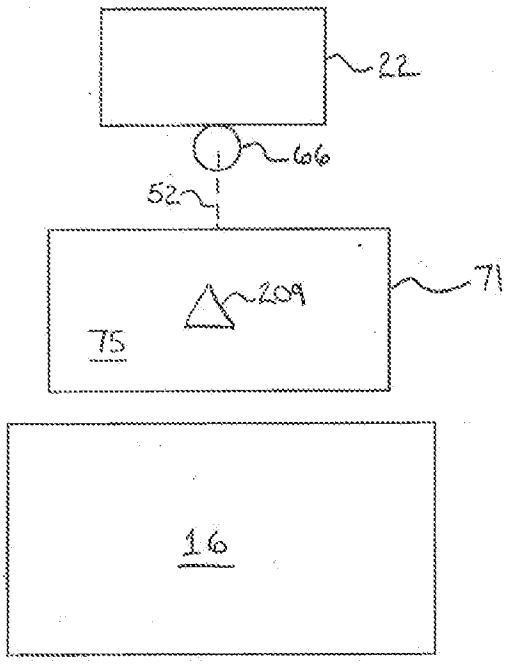


FIG. 5B

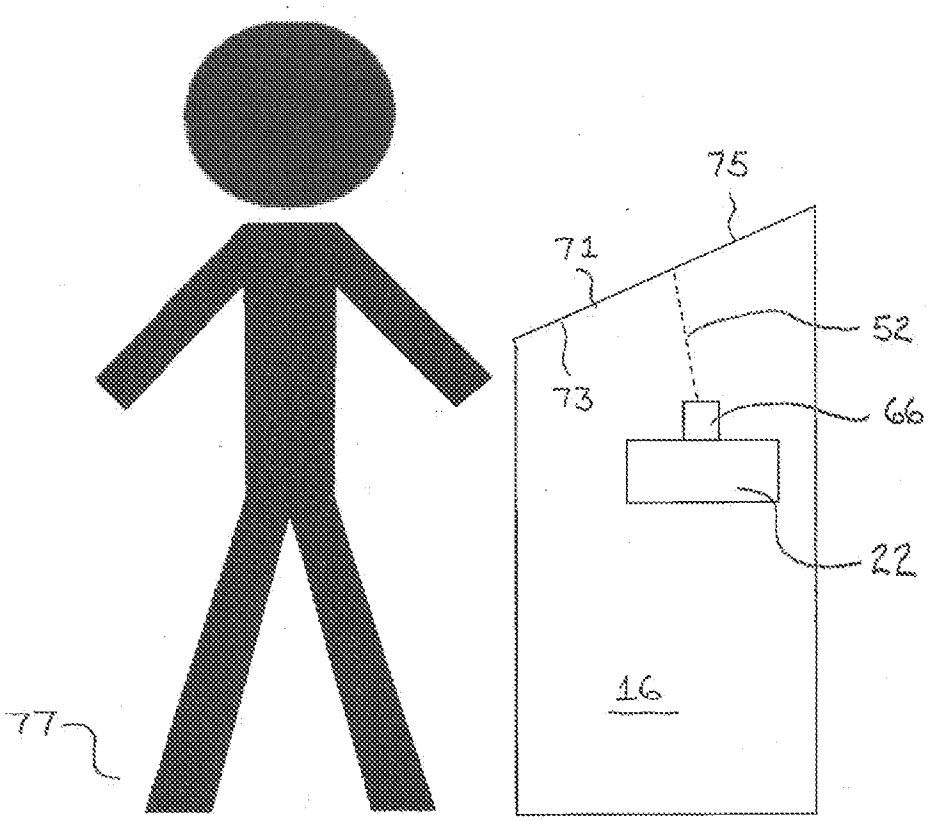


FIG. 5C

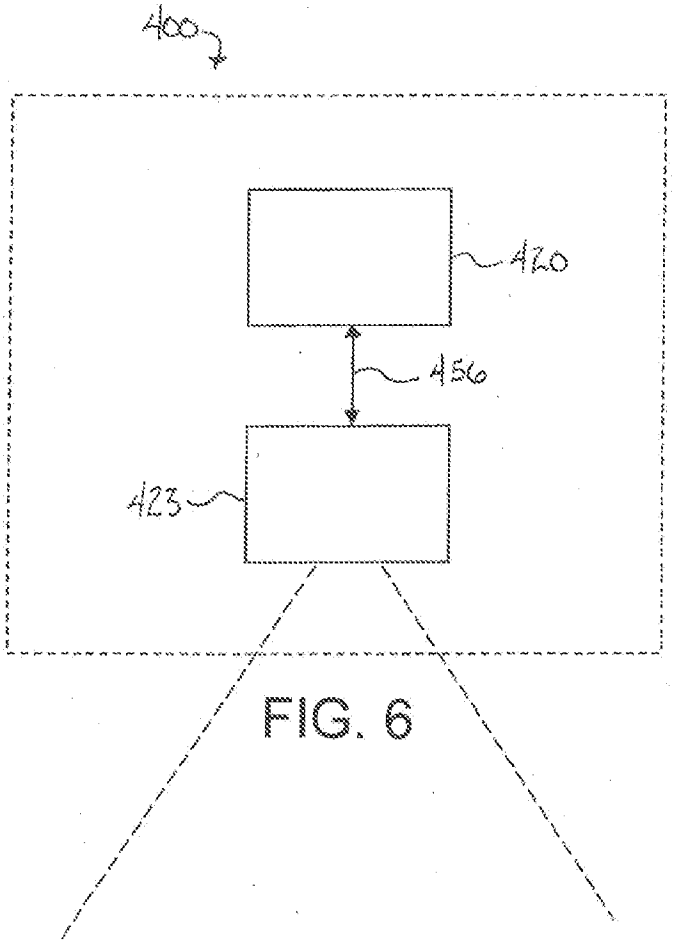
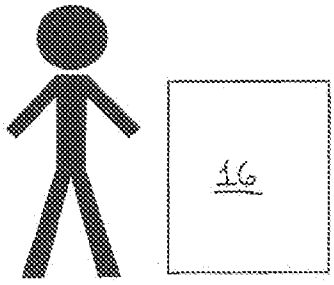


FIG. 6



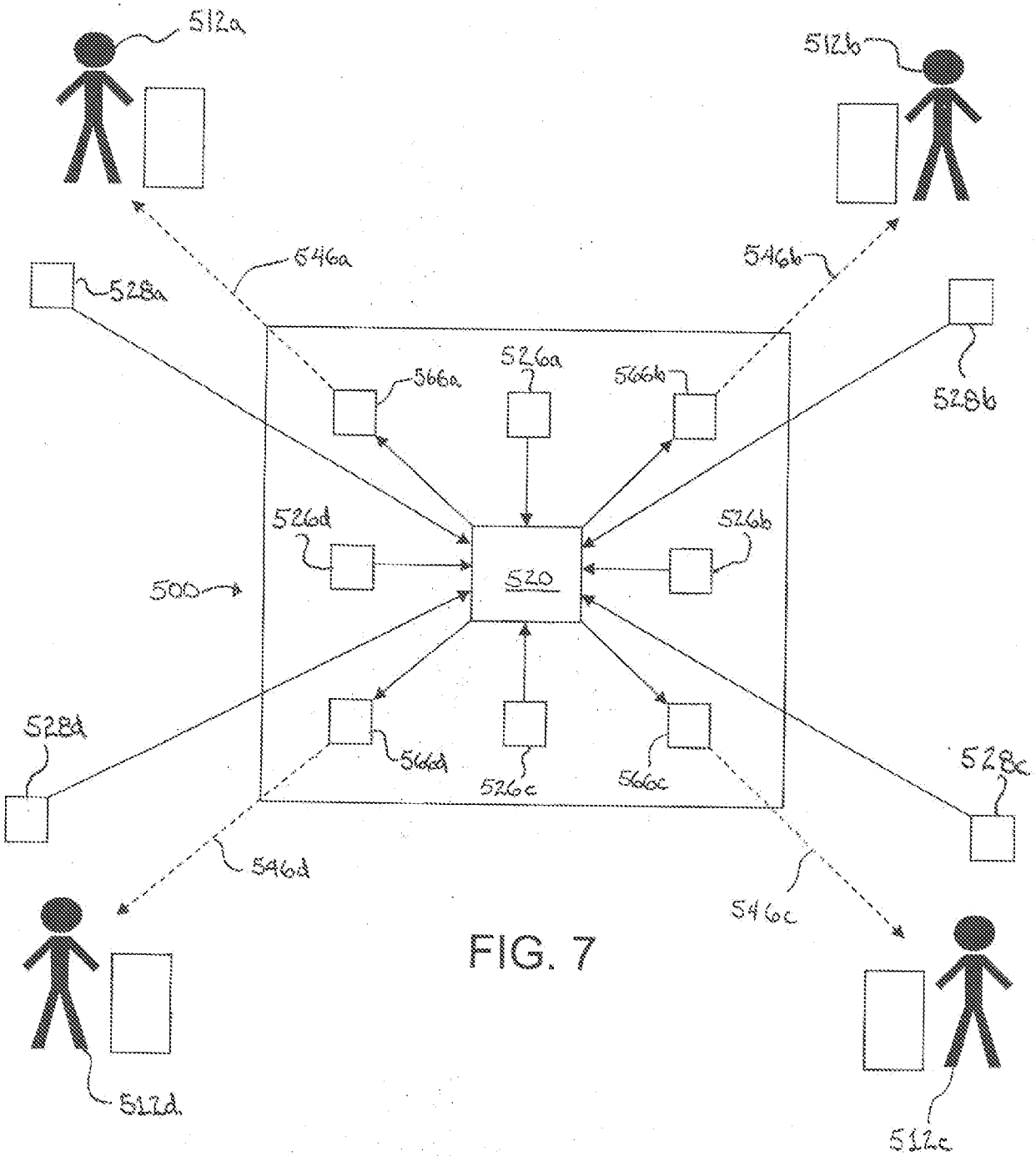

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FIG. 7

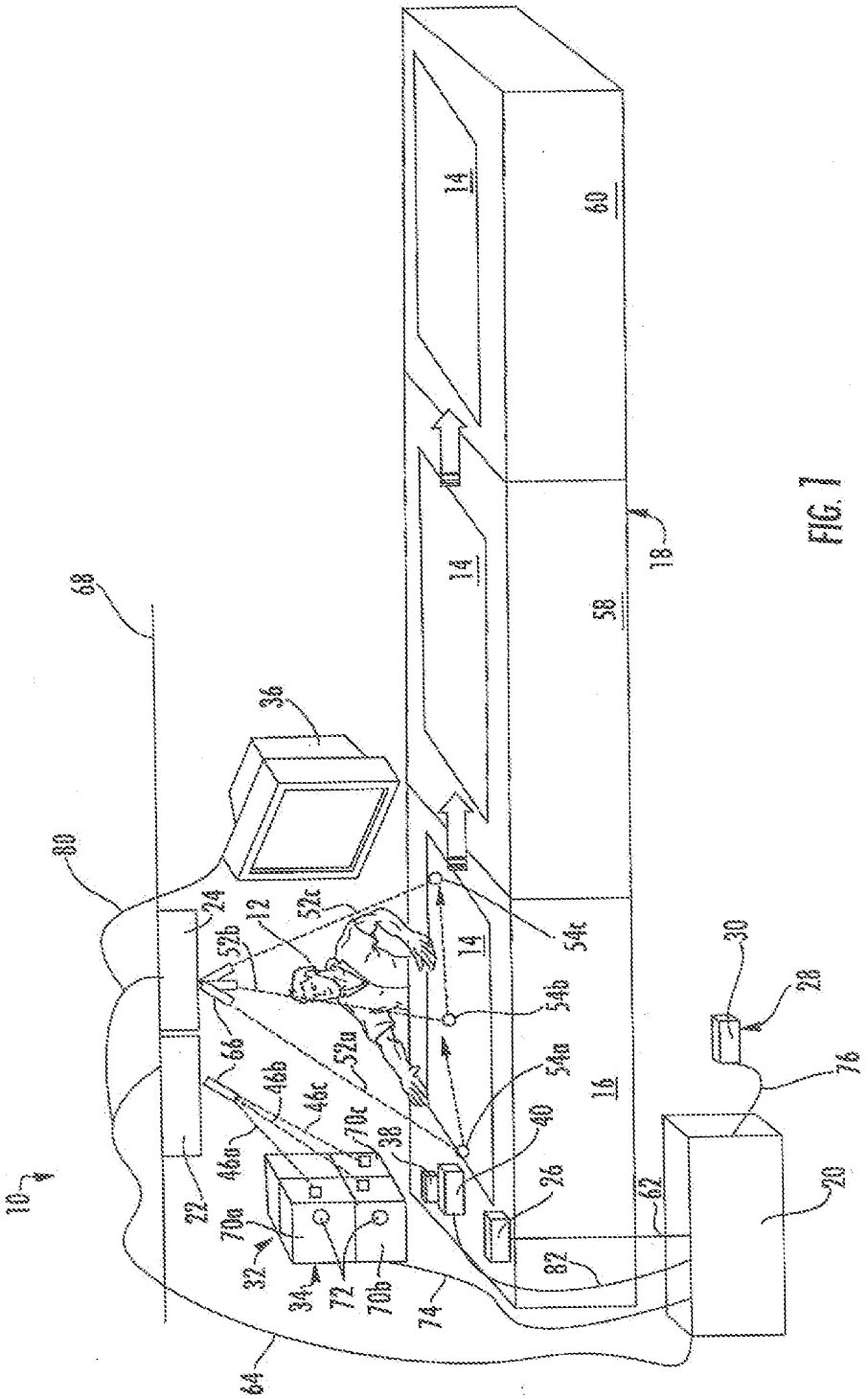


FIG. 1

Prior Art

Pre-assemble

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FIG. 1A

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FIG. 1B

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FIG. 1C

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FIG. 1E

Gauge

FIG. 1F

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FIG. 1G

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FIG. 1H

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FIG. 1I

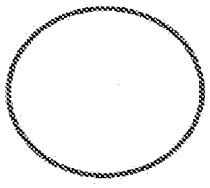


FIG. 1J

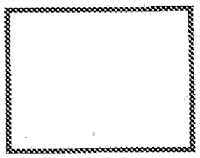


FIG. 1K

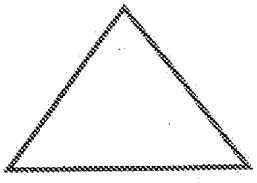


FIG. 1L

Prior Art

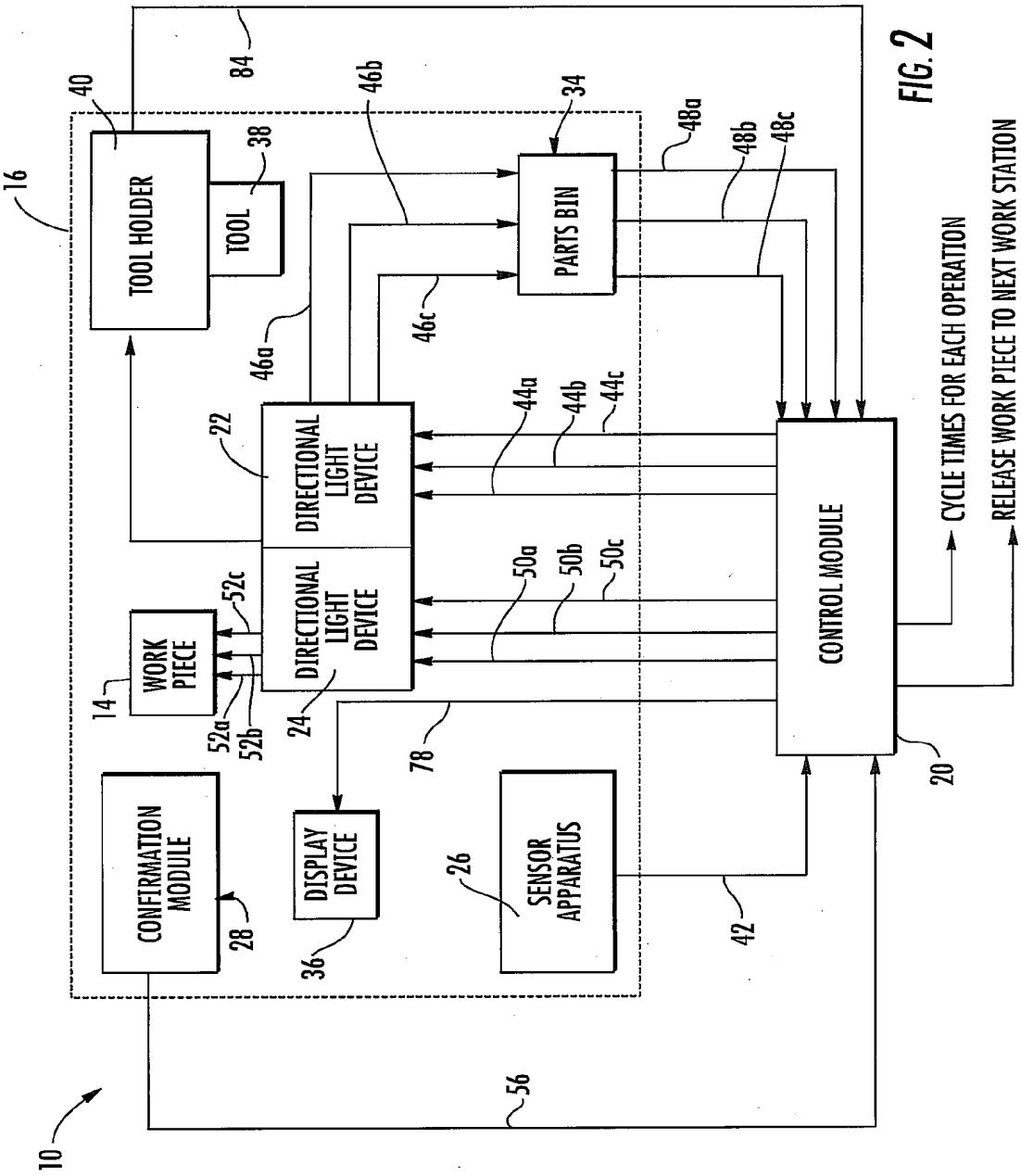


FIG. 2

Prior Art

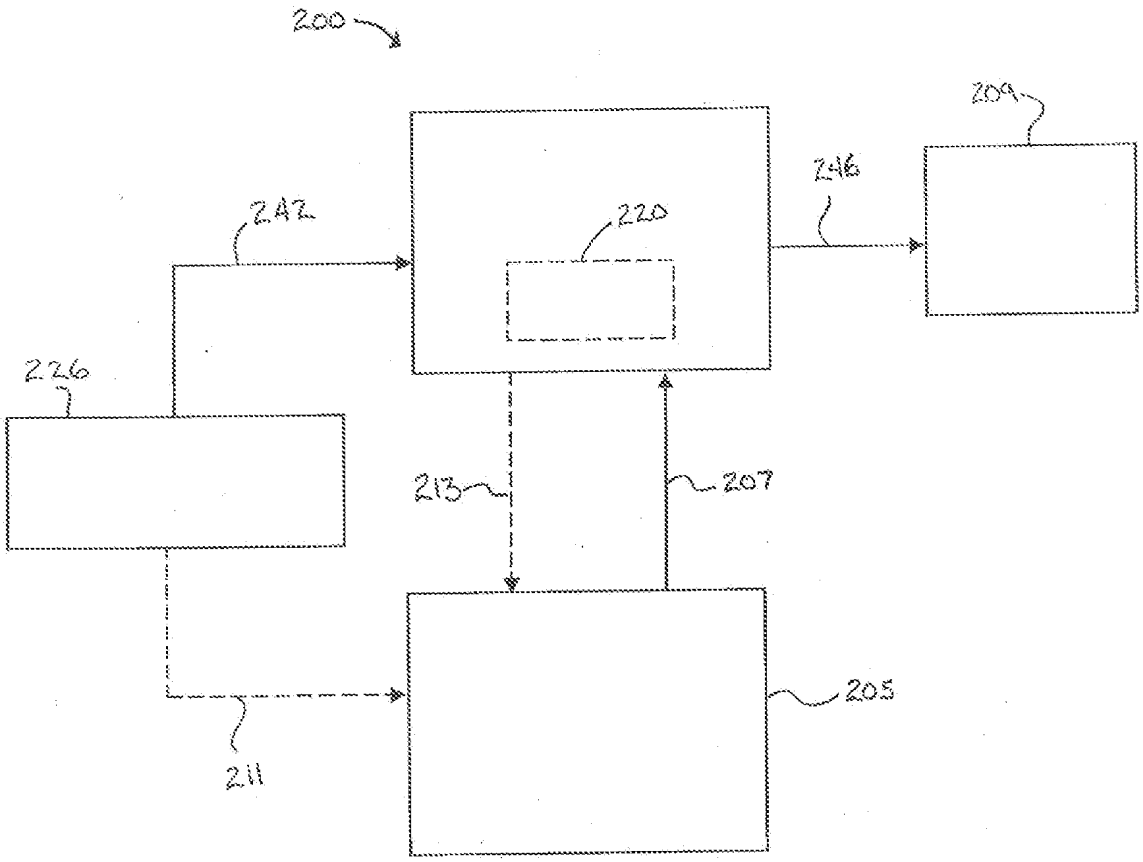


FIG. 3

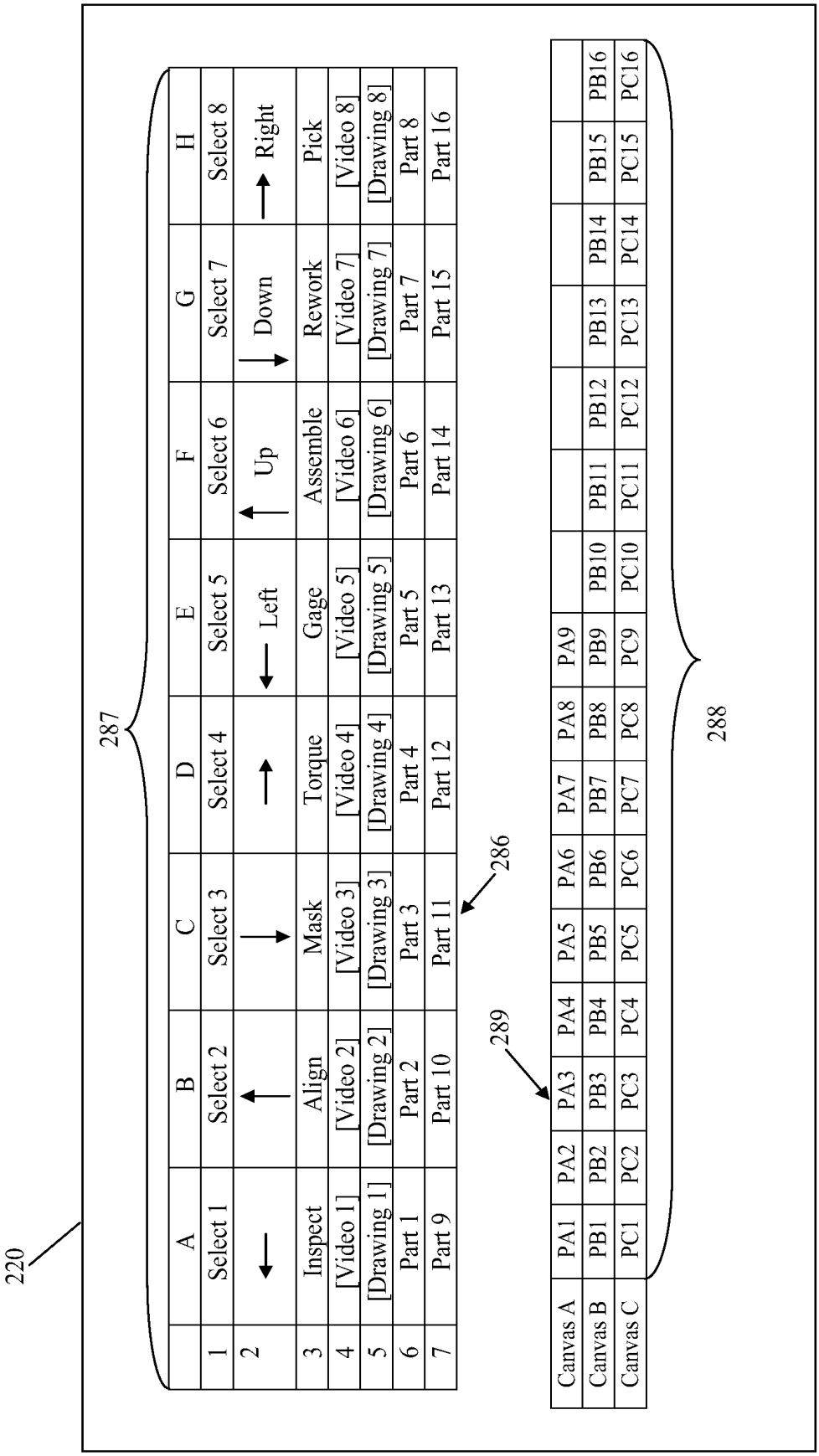

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FIG. 3A

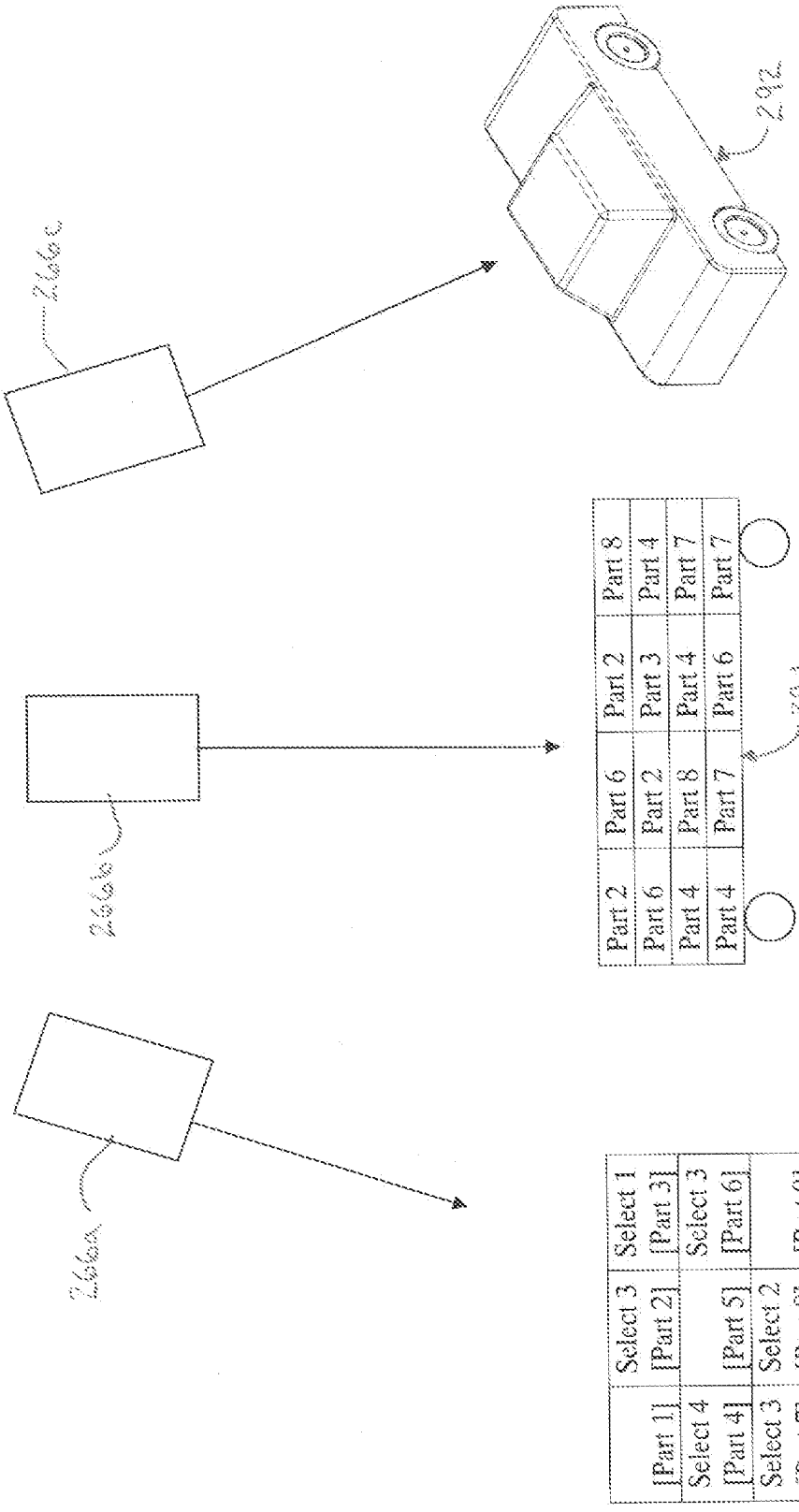

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FIG. 3B

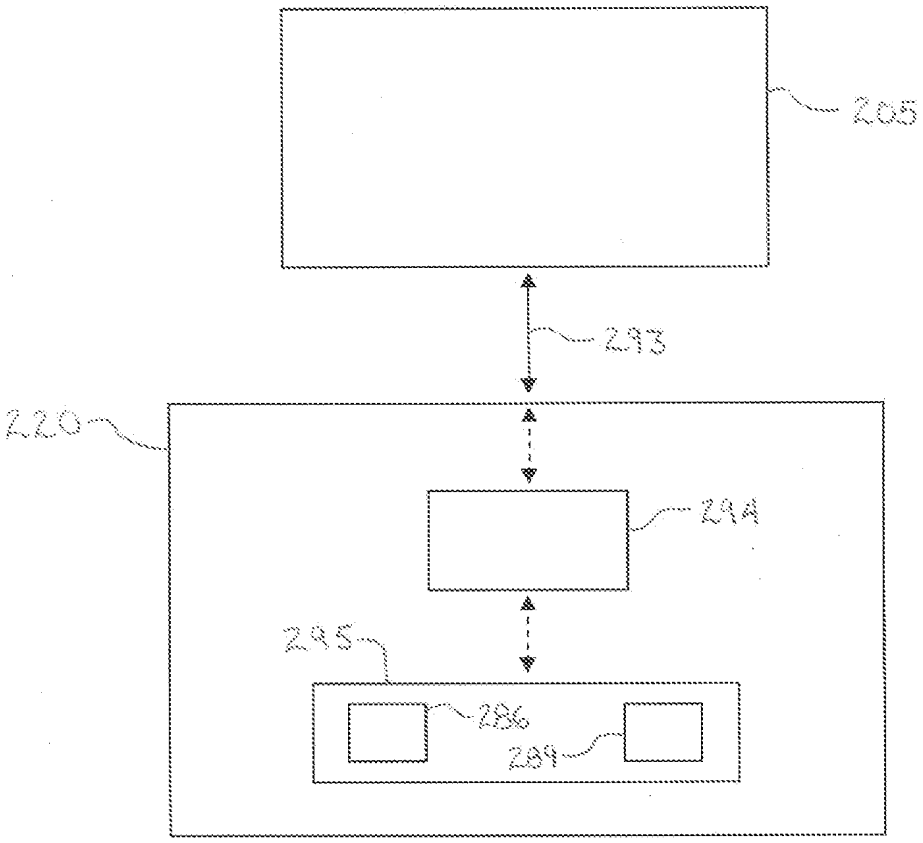


FIG. 3C

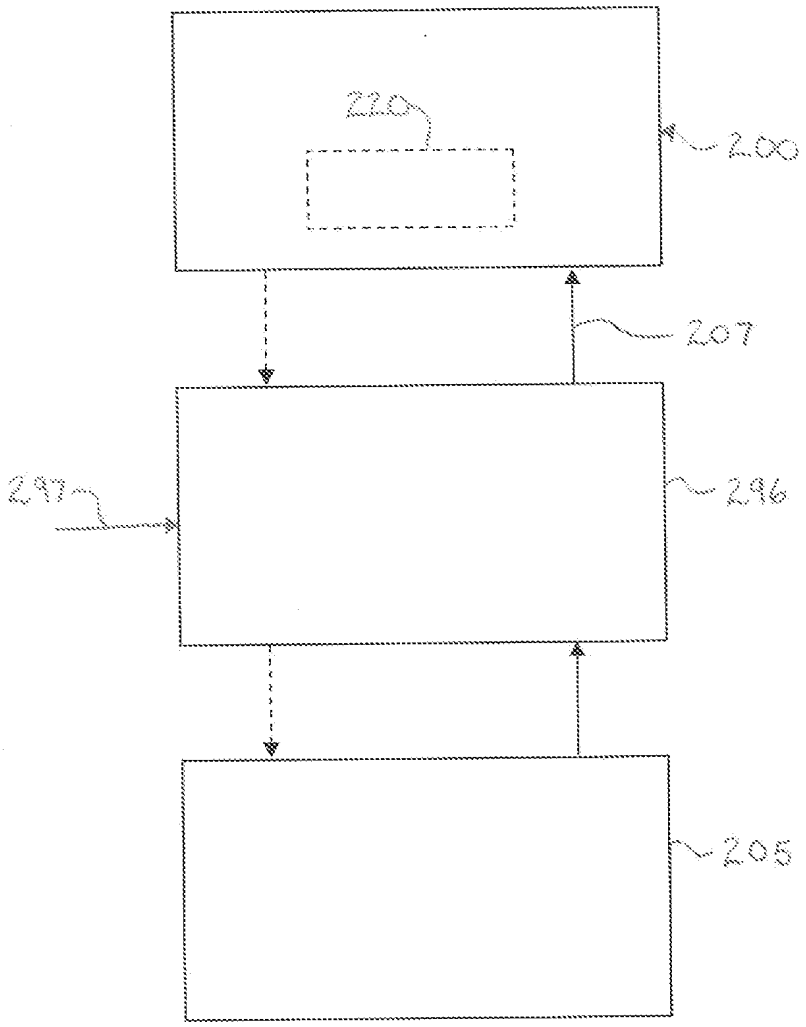


FIG. 3D

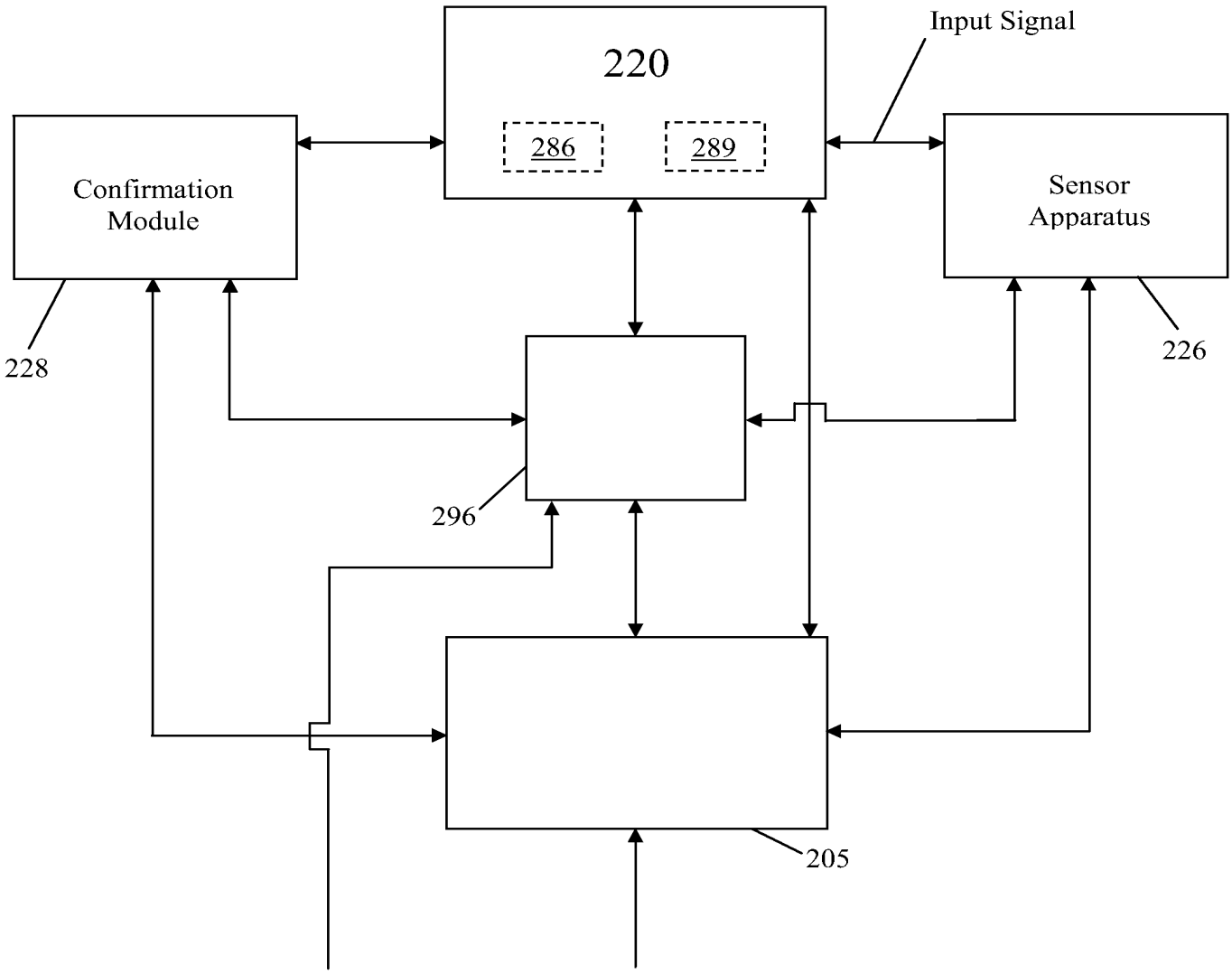

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FIG. 3E

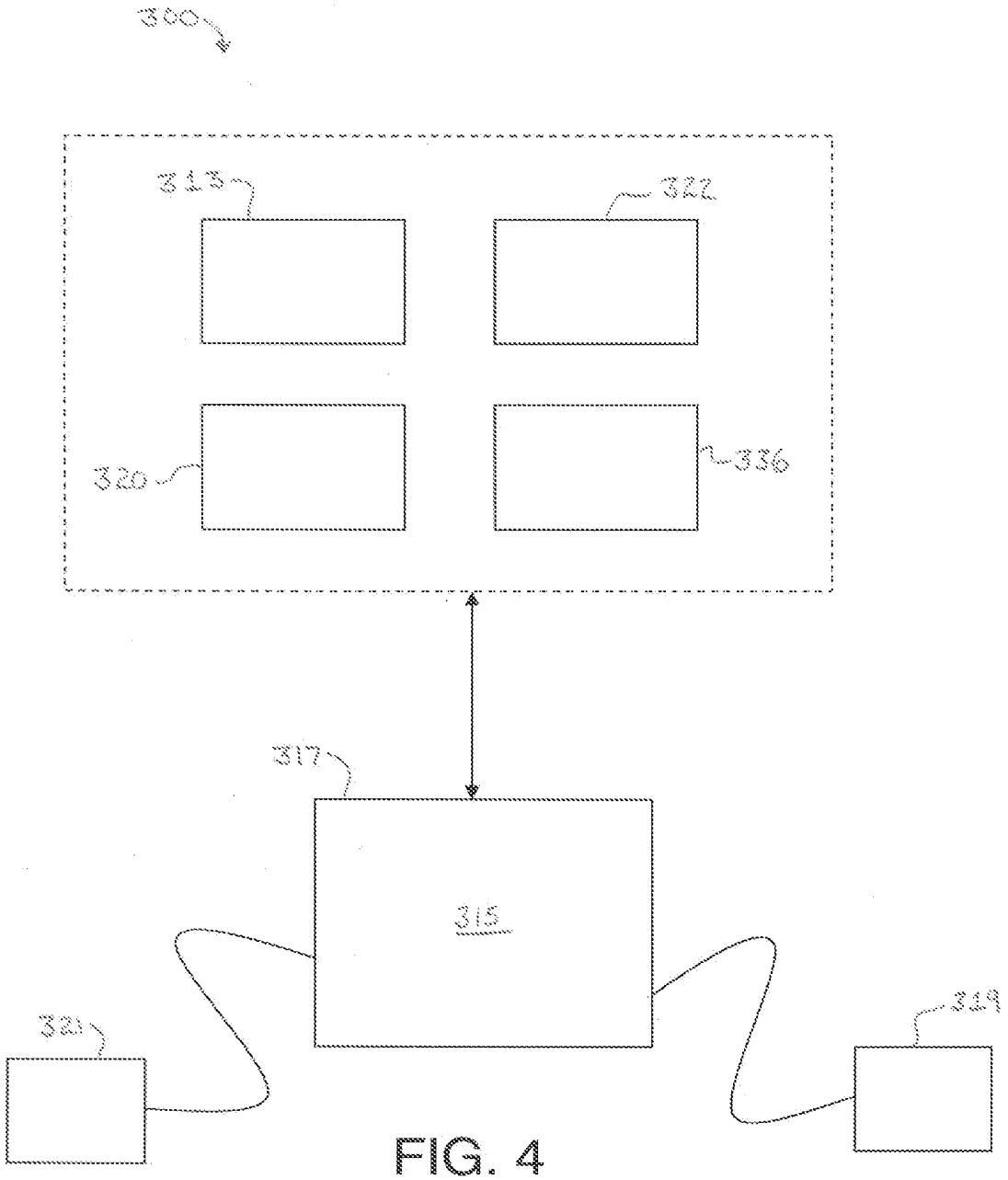


FIG. 4

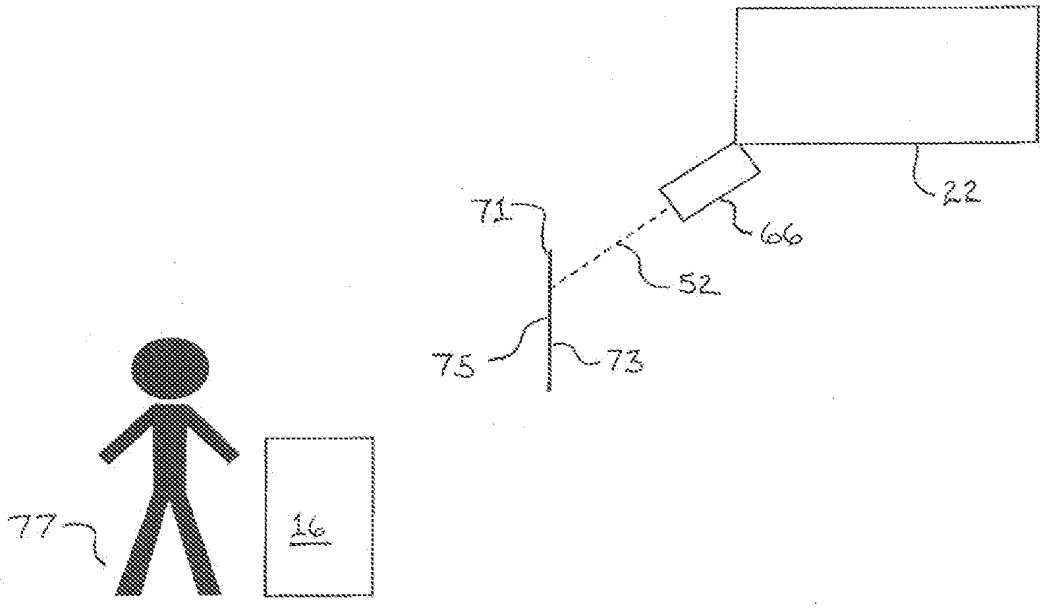


FIG. 5A

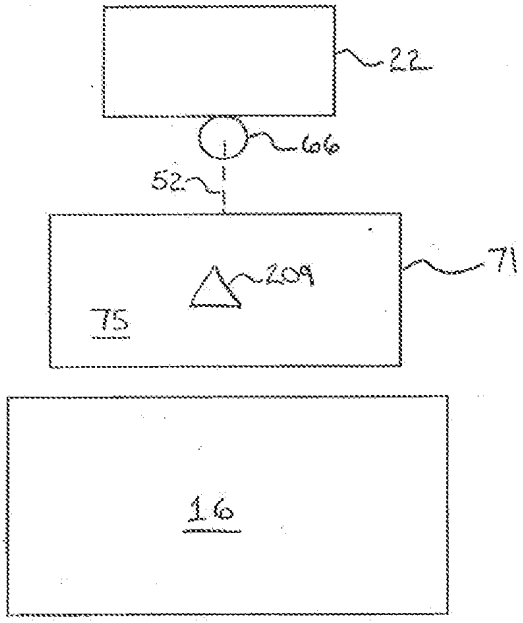


FIG. 5B

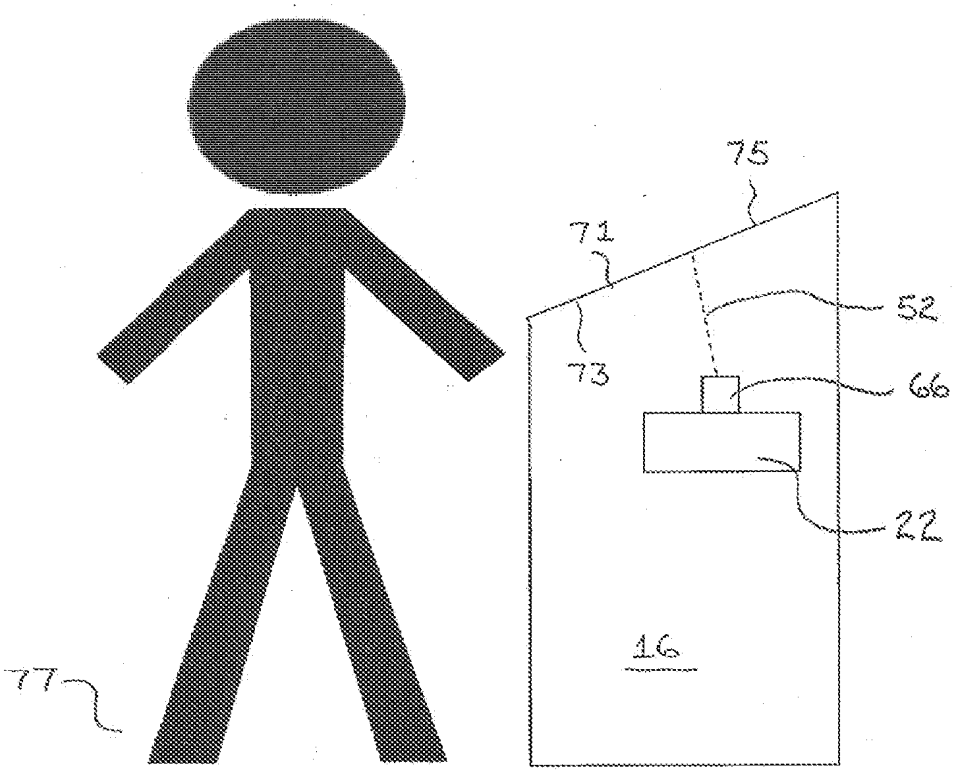


FIG. 5C

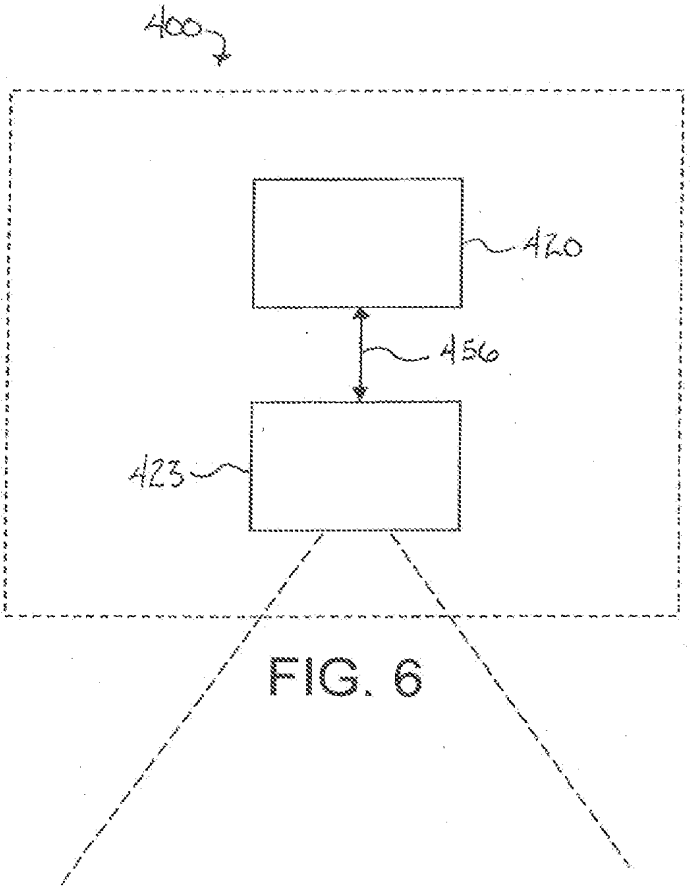
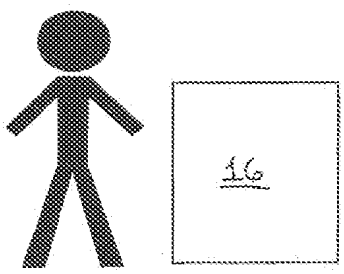


FIG. 6



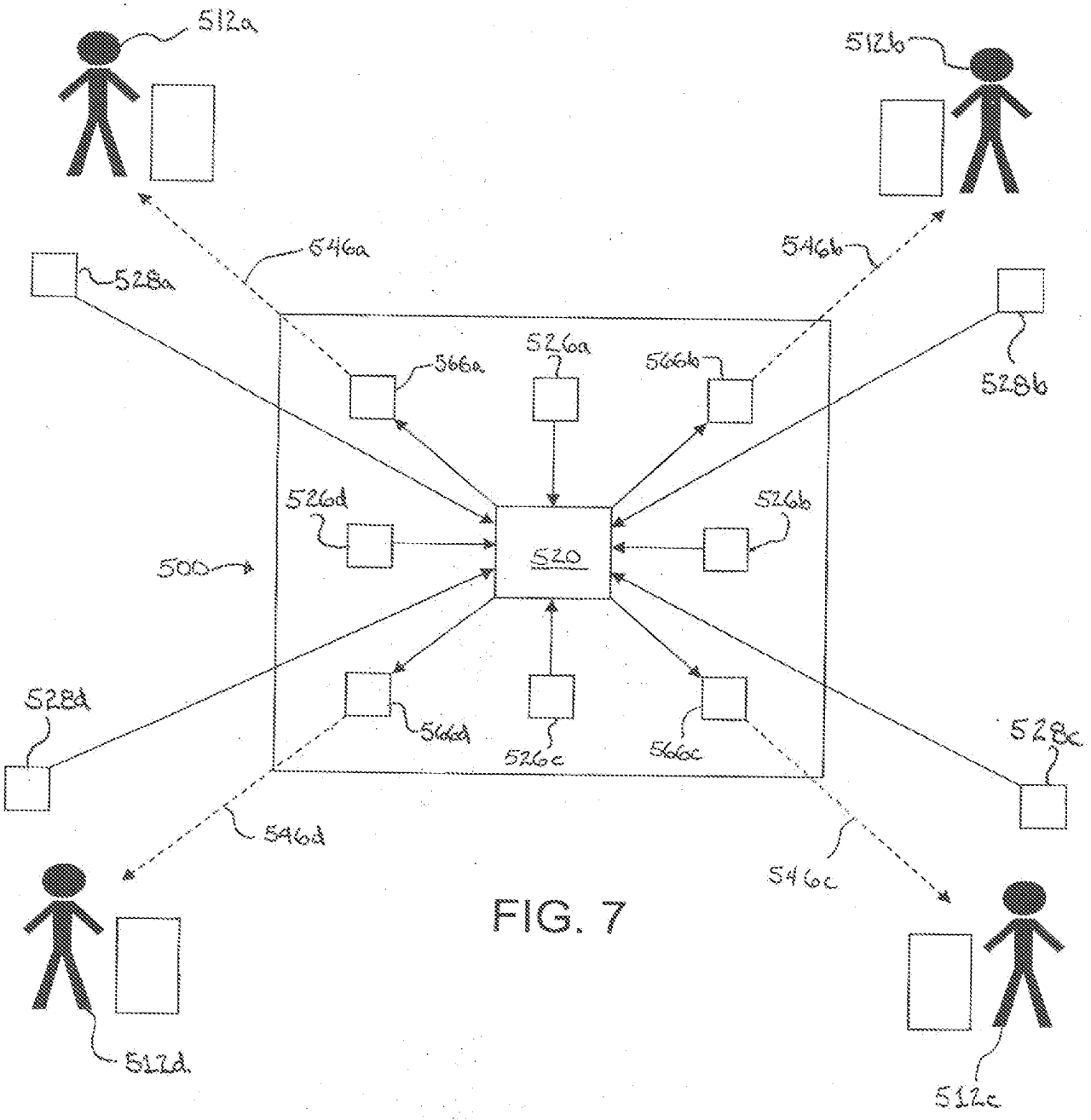

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FIG. 7

Electronic Acknowledgement Receipt

EFS ID:	16552418
Application Number:	13984744
International Application Number:	PCT/US12/24730
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma
Filer Authorized By:	
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	09-AUG-2013
Filing Date:	
Time Stamp:	16:28:32
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$860
RAM confirmation Number	3389
Deposit Account	505553
Authorized User	ONDERSMA, KARL T

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. 1.492 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	01-Transmittal.pdf	215922 e3780468fcce2dc22db5a5744e5cadc82c35c970	no	4
Warnings:					
Information:					
2	Application Data Sheet	02-ApplicationData.pdf	1421081 72d76bf1987c297bbaaff6285a0f7c5e715a630a	no	5
Warnings:					
Information:					
3	Documents submitted with 371 Applications	03-WO2012-109593.pdf	2714647 5c8e6325f79d78f6da80f7020477c502eb3915d4	no	54
Warnings:					
Information:					
4	Drawings-only black and white line drawings	04-ApplicationDrawings.pdf	1623994 ed94729d4bfd347c96aca2c7608738bc79675ca4	no	14
Warnings:					
Information:					
5	Oath or Declaration filed	05-OPS-SolutionsPatentDeclaration.PDF	590408 d6e5f835477b5331333384098899002667813 0d2c	no	1
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6	Preliminary Amendment	06-PreliminaryAmendment.PDF	328485 49da551f071f5eaf863f01d6c4692c281b281175	no	7
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7	Miscellaneous Incoming Letter	07-SubstituteAbstract.pdf	9994 028753467fada8c4f362efbd91dda29fd2659b5f	no	1
Warnings:					
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8	Information Disclosure Statement (IDS) Form (SB08)	08-IDS.pdf	612612 7b037d4a0270171551cc763b2771b8162b9ebd97	no	5
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9	Non Patent Literature	NPL-01-WrittenOpinion.pdf	174889 7229a2e7f08eb86b1e5376a1d9a57510500813e9	no	3
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10	Non Patent Literature	NPL-02-ISRandWO.pdf	245820 a256166416ca7e92caa2ab23da4ebcc9c0f4319a	no	7
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			Total Files Size (in bytes):	7974647	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Filer:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A

Filed as Small Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Basic National Stage Fee	2631	1	140	140
Natl Stage Search Fee - Report provided	2642	1	240	240
Natl Stage Exam Fee - all other cases	2633	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2615	3	40	120
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**860**

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Paul Ryznar et al.
Art Unit	
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7515981	B2	2009-04-07	Ryznar et al.	
	2	4222036		1980-09-09	Troukens	
	3	4163309		1979-08-07	Stuckler	
	4	4102568		1978-07-25	Miyagi	
	5	3986244		1976-10-19	Latanzi	
	6	3667104		1972-06-06	Chamillard et al.	
	7	3623066		1971-11-23	Norris	
	8	3600785		1971-08-24	Cook	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Paul Ryznar et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RYZ01 P-101A

	9	2682117		1954-06-29	Wales	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060185181	A1	2006-08-24	Long et al.	
	2	20060059699	A1	2006-03-23	Krantz et al.	
	3	20040111901	A1	2004-06-17	Newcomer	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Written Opinion of the International Searching Authority for International Application No. PCT/US2012/024730 completed June 14, 2012.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Paul Ryznar et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RYZ01 P-101A

	2	International Search Report and Written Opinion of the International Searching Authority for International Application No. PCT/US2006/39215, June 1, 2007.	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Paul Ryznar et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RYZ01 P-101A

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2013-08-09
Name/Print	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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PTO/SB/01A (09-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number PCT/US2012/024730

filed on February 10, 2012

☐ As amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application. The above-identified application was made or authorized to be made by me/us.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5), or both.

FULL NAME OF INVENTOR(S)

Inventor one: Paul Ryznar Date: August 8, 2013

Signature: _____ Citizen of: US

Inventor two: James Ryznar Date: August 8, 2013

Signature: _____ Citizen of: US

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
KARL T. ONDERSMA

GARDNER, LINN, BURKHART AND FLORY, LLP 2851
CHARLEVOIX DRIVE SE, SUITE 207 P.O. BOX 888695
GRAND RAPIDS MI 49588-8695 USA

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	**02 JULY 2012 (02.07.2012)**
Applicant's or agent's file reference: RYZ01FP101WO	**FOR FURTHER ACTION** See paragraph 2 below: Reply Due December 11, 2012
International application No.: **PCT/US2012/024730**	International filing date *(day/month/year)*: **10 FEBRUARY 2012 (10.02.2012)**
Priority date *(day/month/year)*: 11 FEBRUARY 2011 (11.02.2011)	

International Patent Classification (IPC) or both national classification and IPC

G01C 15/02(2006.01)i

Applicant

RYZNAR PAUL et al

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR	Date of completion of this opinion	Authorized officer
Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. 82-42-472-7140	14 JUNE 2012 (14.06.2012)	PARK, TAE WOOK Telephone No.82-42-481-8420

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2012/024730

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:

   a. a sequence listing filed or furnished
      ☐ on paper
      ☐ in electronic form

   b. time of filing or furnishing
      ☐ contained in the international application as filed.
      ☐ filed together with the international application in electronic form.
      ☐ furnished subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additioanl copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Amazon Ex. 1002.0117

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2012/024730

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-29	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-29	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-29	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: US 2006-0059699 A1 (NORMAN L. KRANTZ) 23 March 2006
D2: US 2004-0111901 A1 (RONALD E. NEWCOMER) 17 June 2004
D3: US 2006-0185181 A1 (CHARLES LONG et al.) 24 August 2006

1. Novelty and Inventive Step
The subject matter of claim 1 differs from these prior art documents in that it includes a guide system controller including a plurality of addressed display features; and it selects an addressed display feature based on said input signal; and it projects a visual indicator corresponding to said selected addressed display feature onto a physical object.

And the subject matter of claim 1 is not obvious to a person skilled in the art by the documents, taken alone or in combination.

Therefore, claim 1 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 2-14 are dependent on claim 1. Therefore they meet the requirements of PCT Article 33(2) and (3).

Claims 15, 24 and 29 relate to guide systems according to claim 1. Claims 15, 24 and 29 are considered to be novel and to involve an inventive step under PCT Article 33(2)-(3), because the subject matter of claim 1 is considered to be novel and to involve an inventive step.

Claims 16-23 and 25-28 are dependent on claim 15 or 24. Therefore they meet the requirements of PCT Article 33(2) and (3).

2. Industrial Applicability
Claims 1-29 are industrially applicable under PCT Article 33(4).

Amazon Ex. 1002.0118

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RYZ01FP100PC	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US06/39215	International filing date (*day/month/year*) 06 October 2006 (06.10.2006)	(Earliest) Priority Date (*day/month/year*) 07 October 2005 (07.10.2005)
Applicant OPS SOLUTIONS LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the Report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      ☒ the international application in the language in which it was filed.
      ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II)
3. ☐ **Unity of invention is lacking** (See Box No. III)
4. With regard to the **title**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   ☐ the text is approved as submitted by the applicant.
   ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,
   a. the figure of the **drawings** to be published with the abstract is Figure No. 1
      ☒ as suggested by the applicant.
      ☐ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

Amazon Ex. 1002.0119

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/39215

Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

NEW ABSTRACT:
An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26) is operable to detect operation information and generate an output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller (20).

Amazon Ex. 1002.0120

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/39215

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **G01M 19/00**(2006.01);**B23P 17/04**(2006.01),**19/00**(2006.01),**21/00**(2006.01);**G06F 17/00**(2006.01)
G06F 19/00(2006.01)

USPC: 29/407.1,407.04,592,700,703;700/95,115
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 29/407.1,407.04,592,700,703;700/95,115

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IEEE/Xplore

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
USPAT; US-PGPUB; USOCR; EPO, JPO, DERWENT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,910,894 A (PRYOR) 8 June 1999 (08.06.1999), entire document.	1-23
A	US 5,119,536 A (LEITZ et al.) 9 June 1992 (09.06.1992), entire document.	1-23
A	US 5,430,662 A (AHONEN) 4 July 1995 (04.07.1995), entire document.	1-23
A	US 5,506,641 A (DORSEY-PALMATEER) 9 April 1996 (09.04.1996), entire document.	1-23
A	US 4,469,553 A (WHITEHEAD) 4 September 1984 (04.09.1984), entire document.	1-23
A	US 4,222,036 A (TROUKENS) 9 September 1980 (09.09.1980), entire document.	1-23
A	US 4,102,568 A (MIYAGI) 25 July 1978 (25.07.1978), entire document.	1-23

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
15 May 2007 (15.05.2007)

Date of mailing of the international search report
01 JUN 2007

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer
David N. Spector

Telephone No. (571) 272-2338

Form PCT/ISA/210 (second sheet) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
VAN DYKE, GARDNER, LINN AND BURKHART, LLP AND ITS
2851 CHARLEVOIX DRIVE S.E., SUITE 207
P.O. BOX 888695
GRAND RAPIDS, MI 49588-8695

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	01 JUN 2007
Applicant's or agent's file reference RYZ01FP100PC	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US06/39215	06 October 2006 (06.10.2006)	07 October 2005 (07.10.2005)

International Patent Classification (IPC) or both national classification and IPC

IPC: Please See Continuation Sheet
USPC: 29/407.1,407.04,592,700,703;700/95,115

Reply Due September 1, 2007

Applicant

OPS SOLUTIONS LLC

1. This opinion contains indications relating to the following items:

- [X] Box No. I — Basis of the opinion
- [ ] Box No. II — Priority
- [ ] Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV — Lack of unity of invention
- [X] Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI — Certain documents cited
- [ ] Box No. VII — Certain defects in the international application
- [ ] Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	15 May 2007 (15.05.2007)	David N. Spector Telephone No. (571) 272-2338

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/39215

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ on paper

☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in electronic form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/39215

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-23	YES
	Claims NONE	NO
Inventive step (IS)	Claims 1-23	YES
	Claims NONE	NO
Industrial applicability (IA)	Claims 1-23	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-23 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location; comprising at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.

Claims 1-23 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry to facilitate product assembly and other operational tasks requiring the execution of a series of sequential steps.

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/39215

Supplemental Box
In case **the space in any of the preceding boxes is not sufficient.**

Continuation of IPC:
G01M 19/00(2006.01);**B23P 17/04**(2006.01),**19/00**(2006.01),**21/00**(2006.01);**G06F 17/00G01M 19/00;B23P 17/04**(2006.01),**19/00**(2006.01),**21/00**(2006.01);**G06F 17/00**
(2006.01)
G06F 19/00
(2006.01)

Amazon Ex. 1002.0125

PCT REQUEST

Original (for **SUBMISSION**)

0	**For receiving Office use only**	
0-1	International Application No.	PCT/US12/24730
0-2	International Filing Date	10-02-2012 10 FEB 2012
0-3	Name of receiving Office and "PCT International Application"	PCT INTERNATIONAL APPLICATION RO/US

0-4	**Form PCT/RO/101 PCT Request**	
0-4-1	Prepared Using	**PCT-SAFE [EASY/EFS-Web mode] Version 3.51.052.228 MT/FOP 20120101/0.20.5.19**
0-5	**Petition**	
	The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	**United States Patent and Trademark Office (USPTO) (RO/US)**
0-7	**Applicant's or agent's file reference**	**RYZ01FP101WO**
I	**Title of Invention**	**LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD**
II	**Applicant**	
II-1	This person is	**Applicant and inventor**
II-2	Applicant for	**US only**
II-4	Name (LAST, First)	**RYZNAR, Paul**
II-5	Address	**49601 Deer Run Drive Northville, Michigan 48167 United States of America**
II-6	State of nationality	**US**
II-7	State of residence	**US**
III-1	**Applicant and/or inventor**	
III-1-1	This person is	**Applicant and inventor**
III-1-2	Applicant for	**US only**
III-1-4	Name (LAST, First)	**RYZNAR, James**
III-1-5	Address	**11535 Ryznar Drive Belleville, Michigan 48111 United States of America**
III-1-6	State of nationality	**US**
III-1-7	State of residence	**US**

PCT REQUEST

Original (for **SUBMISSION**)

III-2	**Applicant and/or inventor**	
III-2-1	This person is	Applicant only
III-2-2	Applicant for	All designated States except US
III-2-4	Name	OPS Solutions, LLC
III-2-5	Address	49601 Deer Run Drive Northville, Michigan 48167 United States of America
III-2-6	State of nationality	US
III-2-7	State of residence	US
IV-1	**Agent or common representative; or address for correspondence**	
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	Agent
IV-1-1	Name	Gardner, Linn, Burkhart and Flory, LLP and its individual attorneys, primarily Karl T. Ondersma
IV-1-2	Address	2851 Charlevoix Drive SE, Suite 207 P.O. Box 888695 Grand Rapids, Michigan 49588-8695 United States of America
IV-1-3	Telephone No.	616.975.5500
IV-1-4	Facsimile No.	616.975.5505
IV-1-5	e-mail	ondersma@glbf.com
IV-1-5(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	as advance copies followed by paper notifications
IV-1-6	Agent's registration No.	55894
V	**DESIGNATIONS**	
V-1	**The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.**	
VI-1	**Priority claim of earlier national application**	
VI-1-1	Filing date	11 February 2011 (11.02.2011)
VI-1-2	Number	61/441,897
VI-1-3	Country	US

PCT REQUEST

Original (for **SUBMISSION**)

VI-2	**Priority document request** The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VI-3	**Incorporation by reference :** where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.		
VII-1	**International Searching Authority Chosen**	Korean Intellectual Property Office (ISA/KR)	
VIII	**Declarations**	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	-	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	1	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	

PCT REQUEST

Original (for **SUBMISSION**)

IX	Check list	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	7	✓
IX-2	Description	31	–
IX-3	Claims	5	–
IX-4	Abstract	1	✓
IX-5	Drawings	14	–
IX-7	TOTAL	58	
	Accompanying Items	Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	✓	–
IX-20	**Figure of the drawings which should accompany the abstract**	3	
IX-21	**Language of filing of the international application**	English	
X-1	**Signature of applicant, agent or common representative**	/Karl T. Ondersma, Reg. No. 55894/	
X-1-1	Name	Gardner, Linn, Burkhart and Flory, LLP and its individual attorneys, primarily Karl T. Ondersma	
X-1-2	Name of signatory	Karl T. Ondersma	
X-1-3	Capacity (if such capacity is not obvious from reading the request)	Agent	

FOR RECEIVING OFFICE USE ONLY

10-1	**Date of actual receipt of the purported international application**	10 FEB 2012 (10.02.12)
10-2	**Drawings:**	
10-2-1	Received	
10-2-2	Not received	
10-3	**Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application**	
10-4	**Date of timely receipt of the required corrections under PCT Article 11(2)**	
10-5	**International Searching Authority**	ISA/KR
10-6	**Transmittal of search copy delayed until search fee is paid**	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	**Date of receipt of the record copy by the International Bureau**	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	: Paul Ryznar and James Ryznar
For	: LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
Int'l Application No.	: PCT/US2012/024730
Int'l Filing Date	: February 10, 2012
Attorney Docket No.	: RYZ01 P-101A
Customer No.	: 15671

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

PRELIMINARY AMENDMENT

Prior to examination in the above-entitled patent application, Applicants wish to amend the application as follows:

Amendments to the Specification are shown on page 2 of this paper;

Amendments to the Claims are reflected in the listing of claims, which begins on page 3 of this paper.

Remarks begin on page 7 of this paper.

A Replacement Abstract accompanies this paper.

LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority of U.S. provisional application, Ser. No. 61/441,897 filed February 11, 2011, by Paul Ryznar and James Ryznar for LIGHT GUIDED ASSEMBLY SYSTEM, which is hereby incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The present invention is directed to improvements in a system for guiding an individual in the performance of operational steps, and in particular a system that provides visual indicators to the individual.

[0003] U.S. Patent No. 7,515,981 provides a LIGHT GUIDED ASSEMBLY SYSTEM for aiding human actions. Numerous activities involve the performance of pre-designated operational steps to properly complete a particular task, with some such activities needing to be completed within a specified or standard time allowance. Problems arise when such activities are improperly performed either from a workmanship standpoint and/or outside the standard time allowance, both of which add significant and undesirable cost and complexity to the manufacturing operations. In the case of failure to meet a standard time allowance, an entire assembly process may become unbalanced resulting in costly bottlenecks and excess inventory.

[0004] In addition to manufacturing assembly operations, numerous other activities involve human performance of particular tasks that are desired to be performed without omitting any steps.

SUMMARY OF THE INVENTION

[0005] The present invention provides a guide system adapted to provide visual indicators to an individual to guide actions.

[0006] According to an aspect of the present invention, a method of projecting visual indicators onto a physical object to guide actions of an individual comprises providing a guide system having a guide system controller and a projector, with the guide system controller including a plurality of addressed display features. The method further comprises providing an input signal to the guide system controller, selecting an addressed display feature based on the input signal, and projecting a visual indicator corresponding to the selected addressed display feature onto a physical object. The guide system controller may further include a plurality of positional identifiers with the method further comprising selecting a positional

Amazon Ex. 1002.0131

identifier based on the input signal, and projecting a visual indicator corresponding to the selected addressed display feature onto a physical object at a location corresponding to the selected positional identifier.

[0007] The guide system controller may be interfaced with a manufacturing execution system (MES), wherein the input signal is provided to the guide system controller from the manufacturing execution system. Alternatively or additionally, the guide system controller may be interfaced with a system controller that controls the operation of an automated process, wherein the input signal is provided to the guide system controller from the system controller. The system controller may be a programmable logic controller and receive signals from a sensor apparatus, wherein the input signal is provided to the guide system controller based on signals received by the system controller from the sensor apparatus. The system controller may be interfaced with a manufacturing execution system. Either the manufacturing execution system and/or the system controller may receive signals from a sensor apparatus, or receive manually input signals, with such signals comprising or deriving an input signal to the guide system controller prompting the projection of a visual indicator.

[0008] The method may further comprise the providing of a confirmation signal to the guide system controller in response to completion of an action by an individual based on the visual indicator. A sensor apparatus may be provided that is operable to detect completion of the action, with the sensor apparatus generating a confirmation signal.

[0009] The guide system may further include a camera operable to image at least one of actions of an individual guided by the visual indicator and the visual indicator, with the method further including recording images while an operator is guided by the guide system and/or recording the time duration while an operator is guided by the guide system. Simultaneously recorded images and recorded time durations may be displayed, such as on a monitor, for evaluating process improvements.

[0010] A guide system for providing visual indicators to an individual to guide actions in accordance with an aspect of the invention comprises at least one directional light device selectively operable to project and target at least one indicating light, a guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers. The guide system controller receives an input signal and causes the directional light device to project a visual indicator corresponding to an addressed

Amazon Ex. 1002.0132

display feature onto a physical object at a location corresponding to a positional identifier based on the input signal.

[0011] The guide system controller may be interfaced with a manufacturing execution system to provide the input signal to the guide system controller, or may be interfaced with a system controller that controls the operation of an automated process to provide the input signal to the guide system. Both the manufacturing execution system and a system controller, such as a programmable logic controller, may receive signals from a sensor apparatus, wherein the input signal is provided to the guide system controller based on the signals received by the manufacturing execution system and/or the system controller from the sensor apparatus. The system controller may be interfaced with a manufacturing execution system.

[0012] A camera operable to image the actions of an individual guided by a visual indicator or a visual indicator itself may be included in the guide system where a controller, such as the guide system controller, records images and time durations while an operator is guided. A monitor interfaced with the guide system controller may be used to view recorded images and time durations.

[0013] Still further, a guide system adapted to provide visual indicators to an individual to guide actions in accordance with the present invention comprises a guide system controller, a projector selectively operable to project and target a visual indicator, and a camera operable to image at least one of actions of an individual guided by the visual indicator or the visual indicator. The guide system controller receives an input signal and causes the projector to project a visual indicator onto a physical object based on the input signal with the guide system controller recording images and time durations while an individual is guided by the visual indicator, which recorded images and time durations may be viewable on a monitor. The guide system controller may include a plurality of programmed addressed display features and a plurality of programmed positional identifiers, wherein the guide system controller causes the projector to project the visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on the input signal.

[0014] A motion sensor may be incorporated with any of the guide systems, with the motion sensor detecting three dimensional spatial motion of an individual, a product, or a workstation process guided by a visual indicator. The motion sensor may output a confirmation signal when the three dimensional spatial motion detected by the motion sensor complies with a

Amazon Ex. 1002.0133

desired action, where the confirmation signal may be transmitted to the guide system controller and/or other controllers.

[0015] According to another aspect of the invention, a guide system adapted to provide visual indicators to an individual to guide sequential actions comprises an operational guide system interfaced with an operational software system or manufacturing execution system, with the operational guide system comprising at least one directional light device selectively operable to project and target at least one indicating light and a controller, with the controller receiving input signals and selectively providing command signals to the directional light device in response to the input signals wherein the projection of the indicating light is indicative of the command signal. The operational software system being operable to provide data inputs to the operational guide system that comprise input signals to the controller. The controller may be programmed with a plurality of addressed display features and a plurality of programmed positional identifiers, where the controller receives an input signal and causes the directional light device to project a visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on the input signal.

[0016] The indicating light may create a human readable display image based on the data inputs, and may comprise numbers, words, alphanumeric characters, a drawing image and/or a video image. The data inputs may alternatively or additionally direct the projection location of the indicating lights. The operational guide system may further include a sensor apparatus that is operable to detect operation information and generate an output indicative of the operation information. Conditional programming can also be employed to redirect an operator to a different set of process steps dependent on the outcome of prior steps as determined by the operator, controller, confirmation devices, and/or computer MES system or the like.

[0017] According to another aspect of the invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises at least one directional light device, a guide system controller, and a camera. The directional guide light device being selectively operable to project and target at least one indicating light for guiding actions of an individual and the guide system controller receiving an input signal and selectively providing a command signal to the directional light device in response to the input signal, wherein the projection of the indicating light is indicative of the command signal. The camera is operable to image the actions of an individual guided by the operational guide system and/or the impingement of the indicating light on an object. Images recorded by the

camera can be viewed in combination with recorded cycle time data to review the recorded process steps and determine corrective actions to optimize the process and/or reduce cycle times.

[0018] In particular embodiments the camera may be a video camera. A monitor may be interfaced with the guide system controller such that images take by the camera are viewable on the monitor. A light controller may be interfaced with the guide system controller for providing input signals to the guide system controller for operatively controlling the projection of the indicating light. A camera controller may also be interfaced with the guide system controller, with the camera controller being operable to control the zoom, viewing position, and/or focus of the camera. Still further, a computer may be interfaced with the guide system controller, such as a distally located computer, with the images taken by the camera being viewable on a monitor of the computer. The computer may also be operable to provide input signals to the guide system controller for operatively controlling the projection of the indicating light and/or the zoom, viewing position, and/or focus of the camera.

[0019] According to yet another aspect of the invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions includes a projection surface having a front surface and a rear surface opposite the front surface. A directional light device selectively projects and targets at least one indicating light on the rear surface of the projection surface to create display images on the projection surface, wherein the display images are viewable by an individual viewing the front surface of the projection surface to guide actions of the individual.

[0020] According to another aspect of the invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises at least one directional light device, a guide system controller, and a motion sensor. The directional guide light device being selectively operable to project and target at least one indicating light for guiding actions of an individual and the guide system controller receiving an input signal and selectively providing a command signal to the directional light device in response to the input signal, wherein the projection of the indicating light is indicative of the command signal. The motion sensor detects three dimensional spatial motion, such as of the individual, product, or workstation process being guided by the indicating light.

[0021] In particular embodiments, the three dimensional spatial motion of the individual detected by the motion sensor comprises a confirmation signal when the detected motion

complies with a desired action. For example, the three dimensional spatial motion of the individual detected by the motion sensor may be transmitted to the guide system controller for comparison with the desired action.

[0022] The operational guide system of the present invention is thus readily programmable and adaptable to provide a cost effective and accurate method of guiding an individual through a series of tasks and may also provide confirmation that the tasks have been fully completed in the proper order, as well as additional information regarding cycle times and images recorded during operations.

[0023] These and other objects, advantages, purposes, and features of this invention will become apparent upon review of the following specification in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a perspective view of an operational guide system constructed as an assembly guide system at a work station of an assembly line;

[0025] FIGS. 1A-1L illustrate exemplary images that may be projected by the light sources of the assembly guide system of FIG. 1;

[0026] FIG. 2 is a schematic illustration of the operation of the assembly guide system of FIG. 1;

[0027] FIG. 3 is a schematic illustration of an alternative operational guide system in accordance with the present invention interfaced with a manufacturing execution system;

[0028] FIG. 3A is a schematic illustration of a guide system controller of the guide system of FIG. 3 including a programmed addressed visual display features and a matrix of positional identifiers;

[0029] FIG. 3B is a schematic illustration of projectors of the guide system of FIG. 3 projecting visual indicators onto objects corresponding to the addressed visual display features and positional identifiers of FIG. 3A;

[0030] FIG. 3C is a schematic illustration of the interfacing of the manufacturing execution system and guide system of FIG. 3;

[0031] FIG. 3D is a schematic illustration of a guide system interfaced with a system controller of an automated process, and of a manufacturing execution system interfaced with the system controller;

[0032] FIG. 3E schematically illustrates various alternatives by which a guide system controller may receive input signals and confirmation signals;

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[0033] FIG. 4 is a schematic illustration of an alternative operational guide system in accordance with the present invention incorporating a camera device;

[0034] FIGS. 5A-5C schematically illustrate a projection surface that may be incorporated with an operational guide system in accordance with the present invention;

[0035] FIG. 6 is a schematic illustration of an alternative operational guide system in accordance with the present invention incorporating a three dimensional spatial motion sensor; and

[0036] FIG. 7 is a schematic illustration of an operational guide system in accordance with the present invention in operation simultaneously guiding activities of multiple individuals.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0037] The present invention is directed toward advances in an operational light guide system that projects lights to guide actions by one or more individuals, such as the operational guide system disclosed in U.S. Patent No. 7,515,981, which is hereby incorporated by reference.

[0038] With reference to FIGS. 1-2, U.S. Patent No. 7,515,981 discloses an operational guide system or guide system 10 in connection with the providing of visual indicators to an operator 12 performing one or more assembly actions on a work piece 14 at a work station 16 of an assembly line 18. The illustrated guide system 10 includes a controller or a control module 20, two directional light devices 22, 24, a sensor apparatus 26, and a confirmation module or device or element 28, shown as a foot pedal 30. Guide system 10 includes a component location 32, which is illustrated as a parts bin 34, a display device 36, and a tool 38 and tool holder 40.

[0039] Guide system 10 is operable, in response to an operation information or characteristic or identification information associated with work piece 14 detected by sensor apparatus 26, to selectively provide indicating lights 46, 52 to guide an operator in the selection and/or assembly of parts to work piece 14, with the indicating lights 46, 52 being directed and/or provided based on, at least in part, the operation information detected by sensor apparatus 26. The system 10 is also or alternatively operable in response to one or more confirmation signals, such as confirmation signals 48, 56, and/or 84 of FIG. 2 that are described below, which may be manually or automatically supplied to control module 20 to verify completion of a particular operation or task. The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing

Amazon Ex. 1002.0137

completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.

[0040] Referring to FIGS. 1 and 2, when work piece 14 initially enters work station 16, the sensor apparatus 26 detects an operation information or characteristic or identification information associated with the work piece 14, such as, for example, the presence of and/or the type of work piece 14 present at the work station 16. In response to the detection by sensor apparatus 26, a first input signal 42 is communicated or transmitted to the control module 20 and, based on the detected or identified work piece 14 that the operator 12 is or will be working on, the control module 20 communicates or transmits a command signal 44 (FIG. 2) to directional light device 22 to project an indicating light 46 at a location on parts bin 34 to guide the operator 12 to a part required for a particular step in the assembly action. After the proper part has been selected, a confirmation signal 48 (FIG. 2) is sent to the control module 20, the control module 20 then transmits a command signal 50 (FIG. 2) to directional light device 24 to project indicating light 52 to indicate the operational step location 54 on the work piece 14 where the selected component is to be installed. Upon completion of a particular operation step, the operator 12 actuates the foot pedal 30 to transmit a confirmation signal 56 (FIG. 2) to the control module 20 verifying that the operation step has been completed. The control module 20 may then send another command signal 49, 50 to one of the directional light devices 22, 24 to indicate the next operation step, or may release the work piece 14 to a subsequent work station 58, 60 for further operations if all required pick and assembly steps have been properly completed.

[0041] Guide system 10 is able to provide visual indicators to operator 12 that are specific to a particular work piece 14 such that, for example, multiple different styles or types of work pieces requiring different components or parts may be processed at work station 16 with a significant reduction in the risk of the occurrence of assembly errors. The assembly guide system 10 thus provides a cost effective and accurate method of guiding an operator 12 through a series of tasks and provides confirmation that the tasks have been fully accomplished and completed in the proper order. The control module 20 may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station 16 for system productivity reporting, or the like.

[0042] Assembly guide system 10 is shown in FIG. 1 in connection with work station 16, where work station 16 is part of an assembly line 18 that includes additional work stations 58,

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60 for performing subsequent operations. Additional assembly guide systems could be included at the other work stations of assembly line, or a single assembly guide system could be used to aid operations at more than one work station.

[0043] As noted, sensor apparatus 26 functions to detect an operation information or characteristic or identification information associated with work piece 14, such as the presence and/or type of work piece 14 located at the work station 16, and may be constructed as one or more of a number of known sensors such as, for example, a proximity switch, light curtain, photo eye, radio frequency identifier device, bar code reader, or the like. When constructed as a radio frequency identifier device or bar code reader, a readable tag or bar code may be placed on either the work piece or the structure upon which the work piece is supported while traveling on the assembly line. The tag or bar code may contain information regarding the type of work piece at the work station, such as the model of the work piece, measurements related to the work piece, or the type of components required. A scanner or reader may be handheld by the operator or mounted to the assembly line, with the scanner being able to read the information from the tag or bar code when the work piece enters the work station. Alternatively, a sensor apparatus may comprise a vision system configured to detect an identifiable characteristic or identification information associated with a work piece. Guide system 10 may alternatively be activated or sequentially stepped to subsequent operations by non-automated signals. For example, an operator may manually enter a part type into the system, depress a palm button, press a touch screen, or simply commence operations or pre-operations on a part.

[0044] The type of part present at a particular work station need not be determined using a bar code or radio frequency system. For example, and as is known in the art, standard binary type sensors or cameras may be used to detect geometrically distinguishing features of a work piece or the structure upon which it is located to "identify" the work piece. Still further, an assembly guide system could be constructed where an operator uses a hand held scanner to scan a bar code label affixed to the work piece or the structure supporting the work piece as opposed to the scanner being mounted directly to the assembly line. The sensor apparatus may also be used to detect the relative orientation of a work piece with respect to the work station, with the control module adapted to receive the positional information and provide accordingly adjusted command signals to the directional light devices such that the projected indicating lights accurately impinge on the desired operational step locations. Still further, the

Amazon Ex. 1002.0139

presence of a part at a work station may be supplied to the operational guide system by a manual operator activated input signal, such as by a touch screen, a palm button, or the like.

[0045] Control module 20, in the illustrated embodiment, is a computer controller device and as indicated is adapted to receive and send various signals to monitor and guide the assembly actions at work station 16. Control module 20 may be constructed as a desktop or laptop style PC, a PLC, or the like, or may be a networked computer system that may be used to control and monitor other aspects of the assembly line and work stations.

[0046] As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. In the illustrated embodiment of FIG. 1, the first input signal 42 is transmitted to the control module 20 directly from the sensor apparatus 26 along communication link 62, where link 62 is a computer cable, fiber optic line, or the like. Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station. The identification information, as previously indicated, may simply indicate the presence of a part at the work station and/or may include information regarding the type of work piece at the work station, such as the model of the work piece, measurements related to the work piece, or the type of components required. Optionally, a sensor apparatus and control module may be alternatively constructed to wirelessly transmit and receive identification information.

[0047] In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42. In the illustrated embodiment, two substantially similar directional light devices 22, 24 are provided at work station 16 and are responsive to the command signals 44, 50 of the control module 20. Directional light device 22 is used to project indicating lights 46 at the component location 32, while the other directional light device 24 is used to project indicating lights 52 at operational step locations 54 on work piece 14. Each directional light device 22, 24 includes a light source 66 for projecting indicating lights 46, 52, with the directional light devices 22, 24 constructed such that the indicating lights 46, 52 may be selectively and movably positionable to direct the indicating light 46, 52 at pre-targeted locations. The light sources 66

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may also be constructed to provide an indicating light beam of selectively adjustable brightness to compensate for ambient surroundings and/or the distance from the light source to the selected impingement point. Although light sources 66 are illustrated in FIG. 1 as projecting a single indicating light beam, it should also be appreciated that light sources 66 may be constructed to simultaneously project two or more beams such that, for example, multiple parts may be indicated for selection from location 32 by the operator 12 or multiple assembly locations may be indicated.

[0048] Light sources 66 may be constructed as laser light sources that are able to project a focused, coherent beam of light at a desired location. Laser light sources may preferably be class 3 or lower lasers for employment within a visual setting for operators. Alternatively, light sources other than lasers may be used and still function as intended, such as standard projectors, incandescent lights, light emitting diodes (LEDs), or the like.

[0049] Light sources 66 may be constructed such that they produce light of differing color from each other to provide further visual cues to the operator 12 while working at work station 16. Furthermore, light sources may be adapted to project animated images or videos onto a surface, such as a surface of the work piece 14, assembly line 18, or a work station 16, 58, 60. The projected animated images or videos may be, for example, a training video, and may be in a .mpeg, .wmv, or other such file format provided by or stored in, for example, a control module of an operational guide system.

[0050] Referring to FIGS. 1A-1L, the directional light devices 22, 24 may also include known optical effect devices for fanning or adapting or configuring the projected indicating lights 46, 52 produced by the light sources 66 into a desired shape, pattern, or form at the point or location at which the indicating light 46, 52 impinges the component location 32 or operational step location 54. For example, the indicating light may initially be projected as a geometric shape (FIGS. 1J-1L), such as a circle, about a particular location to quickly attract the operator's attention, and then focus to a point or circle of smaller diameter at the specific location. The indicating light may also be projected to produce alpha numeric characters, such as shown in FIGS. 1A-1I, blink, and/or produce rotating images. For example, sequential numbers may be projected where each number indicates a step in the assembly action being preformed by the operator at the work station, or part numbers or textual information may be projected to provide written guidance to the operator. Indicating lights projected by light sources, as described in more detail below, may further be configured to

Amazon Ex. 1002.0141

display videos or pictures or animation on the surface upon which the indicating light impinges. The configured images form a type of display graphic or visual display feature ("VDF") exhibited by an indicating light, such as indicating light 46 or 52, when projected onto a surface, with FIGS. 1A-1L representing exemplary display graphics or VDFs.

[0051] As previously noted, indicating lights 46, 52 may be projected at component location 32 or at operation step locations 54 associated with work piece 14. Component location 32 is exemplified as a parts bin 34 having multiple storage locations 70 for holding various parts required in the assembly of work pieces 14. As shown, directional light device 22 is functional to selectively project an indicating light 46 at discrete storage locations 70 of parts bin 34 in response to command signal 44 to prompt the operator 12 regarding part selection.

[0052] RFID tags, or the like, may also be used to supply information to the control module 20. For example, an RFID tag located on a parts bin 34 may be used in connection with assembly guide system 10 for monitoring the presence and/or proper location of the parts bin 34. In the event assembly guide system 10 detected, such as by control module 20, the absence of parts bin 34 an error message could be, for example, displayed by display device 36, or projected by a light device 22, 24, or an audible warning message may be broadcast.

[0053] In the illustrated embodiment of FIG. 1, storage locations 70 of parts bin 34 include detection devices 72 that are intended to detect or sense when a component has been withdrawn from a particular storage location 70. Detection devices 72 may be of known construction and are selected based on a particular application, taking into consideration the types or models of work pieces 14 and parts to be assembled. Detection devices 72, for example, may comprise light curtains, proximity sensors, electronic mats, such as pressure sensitive mats, machine vision systems, or the like.

[0054] The detection devices 72 are operable to transmit a confirmation signal 48 to the control module 20 along link 74 upon selection by the operator 12 of a part from a particular storage location 70, with control module 20 being functional to determine whether or not the operator 12 has selected the correct part as prompted. In response to the confirmation signal 48, if the operator 12 selected the proper part as directed by the indicating light 46, control module 20 may terminate the indicating light 46 projecting from directional light device 22 at the storage location 70 and transmit a subsequent command signal 50 to directional light device 24 to project an indicating light 52 to the operational step location 54 on the work piece 14 where the just selected part is to be assembled. However, if control module 20

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determines that an incorrect part has been selected as compared to what should have been selected as prompted by the indicating light 46, control module 20 will not provide the subsequent command signal 50. In addition, control module 20 may be constructed to provide a visual or audible signal to the operator 12 when an improper part has been selected from a storage location 70.

[0055] Although not illustrated, the parts bin may additionally employ a known pick-to-light system whereby each storage location includes an illumination device, such as an LED light or the like, that lights up to prompt the operator as to the proper storage location from where a part is to be selected. When the assembly guide system includes such a pick-to-light system, the directional light device 24 used to project an indicating light 46 at a component location 32 may optionally be excluded.

[0056] As noted above, assembly guide system 10 includes confirmation module 28, which in the illustrated embodiment is a foot pedal 30. Confirmation module 28 is constructed to transmit a confirmation signal 56 along link 76 to control module 20 to signal that the operational step indicated by directional light device 22 or 24 has been completed. To transmit the confirmation signal 56, operator 12 simply depresses foot pedal 30 upon completion of the directed activity. The confirmation signal 56 transmitted by foot pedal 30 then triggers control module 20 to selectively transmit another command signal 44, 50 to provide guidance to the operator 12 regarding the subsequent operational step that must be taken by the operator 12 at the work station 16 in accordance with work piece 14. For example, the assembly guide system 10 may cause an indicating light 46 to be projected at a storage location 70 for the next required part. Alternatively, the control module 20 may provide a command signal that releases the work piece to the next work station 58 if all of the operational steps at the current work station 16 have been completed.

[0057] Although illustrated as a foot pedal 30, it should be understood that numerous alternative confirmation modules 28 may be utilized. For example, confirmation module 28 may be constructed as a pressure sensitive mat, push button, toggle switch, palm button, light curtain, touch screen, touch pad, part present sensor or the like, which is constructed to be depressed, switched, or otherwise activated by a manual action of the operator 12. A sound activated signal may alternatively be employed, such as a voice command, to provide a confirmation signal. Confirmation module 28 may also be constructed as a wireless transmitter, thereby eliminating the need for a physical link. Further, operational guide..

Amazon Ex. 1002.0143

system may be adapted to receive and/or respond to other confirmation signals and/or sources as additional technologies become available.

[0058] Still further, a confirmation module or device or element may be constructed to automatically detect when an operator has completed a manual step. For example, a confirmation module may be constructed as a vision system that is able to detect the presence or absence of a component at a location, such as by processing an image captured by a pixilated imaging device, as is known in the art. Alternatively, for example, the confirmation module may be constructed as a proximity sensor, photo eye, light curtain, or the like, constructed to automatically detect the presence or absence of a part upon assembly to the work piece. Still further, a confirmation signal may be transmitted by an automated tool or measuring device, such as a torque gun, weight scale or other type of measuring device, as described in more detail below. In which case, the automated tool or measuring device may function as a confirmation module. An indicating light projected by a light source of an operational guide system may also be used to provide a confirmation signal where, for example, a sensor is employed at the light source or elsewhere on the operational guide system to detect the reflection of an indicating light from a part or component that requires verification. The light sources may also be used as a "light curtain" by being projected at a particular location or parts bin, or the like, with a sensor adapted to detect that an operator has properly selected from that location.

[0059] It should also be appreciated that an operation information could be transmitted to the controller 20 from a remote signal. For example, in the case of a part kitting operation, an order request may be transmitted to a work station from a central processing location, such as a computer system or the like, and transmit a signal to the work station regarding, for example, what parts to gather and/or assemble. In which case, the work piece of the operation may comprise a collection of parts assembled into a parts holder.

[0060] Although not illustrated, an assembly guide system may also incorporate known ultrasonic, electromagnetic, and/or similar technology used to confirm, for example, that a tool is placed onto the proper bolt or nut at an assembly operation. Such technology is configured to send and receive ultrasonic frequencies with the spatial location of a sent or received signal being monitored to confirm that an operation is performed at a proper location. Thus, an assembly guide system may be configured to utilize both light sources and

Amazon Ex. 1002.0144

ultrasonic, electromagnetic, and or similar technology to confirm assembly or other manual process steps.

[0061] Assembly guide system 10 also includes a display device 36 that is able to receive display signals 78 (FIG. 2) along link 80 (FIG. 1) from control module 20 and to relay information to the operator 12. Display device 36 may be constructed as a television, LCD, LED device, or other type of viewable display mechanism. Display device 36 may be used to present information to the operator 12 such as, for example, the sequential steps needing to be performed, work instructions associated with the work station 16, images of a work piece 14 properly affixed with the part that is to be assembled, information regarding a missed or improperly performed assembly step, or the like. In the case of sequential steps, display device 36 may be configured to highlight the current step under consideration and/or provide an indication that previous steps have been completed. The display device 36 may be constructed as a touch screen device adapted to be depressed by an operator to provide a confirmation signal regarding completion of a particular step. The inclusion of such a touch screen device may also provide the ability to prompt or guide an operator through certain operational or assembly steps that do not require guidance via indicating light signals. The display device may also be used to show or provide instructional videos, display running cycle times, desired cycle times, and/or alerts, or the like. In the case of a touch screen, the touching by an operator of a particular location or tab area of the screen may display of a video or an image on the display screen, or another display screen, or may initiate the projection of an indicating light or video.

[0062] Optionally, assembly guide system 10 may be used in connection with a tool 38 and a tool holder 40. Tool 38 may comprise, for example, a manual tool such as a wrench, torque wrench, pliers, screwdriver, or the like, or may be an automated tool such as an electric screwdriver, air gun, electric torque wrench, or the like. Tool 38 may otherwise be a manual or automated measuring device such as calipers, a gauge block, feeler gauges, air gauge device, or the like. Tool holder 40 is intended to provide a storage location for tool 38 when tool 38 is not in use. Directional light devices 22, 24 may project an indicating light onto tool 38 and/or tool holder 40 in response to a command signal when tool 38 is required to complete a pending operational step, such as in a similar manner as described above with respect to storage locations 70 of parts bin 34 and operation step locations 54 on work piece 14. Tool holder 40 may include a sensor and thereby be integrated with the assembly guide

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system 10 to detect when tool 38 is positioned within or removed from tool holder 40, where the sensor may be a photo eye, proximity switch, light curtain, or the like.

[0063] Although not illustrated, the assembly guide system may utilize an automated gauge or tool that is electrically linked to control module such that control module is able to monitor both the use of the tool as well as an operational parameter associated with the tool. For example, if a tool is constructed as a torque wrench, the control module may be constructed to monitor the fastening torque obtained by the torque wrench and to compare the value to a preprogrammed or predetermined or threshold value prior to transmitting a subsequent command signal. The control thus may function to transmit the subsequent command signal only after the desired or appropriate torque has been applied by the torque wrench. Similarly, if the tool is constructed as a measuring device, such as digital calipers, control module may be constructed to receive a measurement value, and may compare the measurement value to a threshold measurement value, and may communicate or transmit the subsequent command signal when the measurement value is at or near the threshold measurement value.

[0064] Control module 20 is illustrated as transmitting command signal 44a to directional light device 22, which in response to command signal 44a, projects indicating light 46a on storage location 70a of parts bin 34. Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part. Operator 12 then activates foot pedal 30 (or other confirmation device), which transmits confirmation signal 56a to control module 20 and the above process is repeated for indicating lights 46b, 52b, 46c, 52c, storage locations 70b, 70c, and operational step locations 54b, 54c.

[0065] As described in more detail below, the control module 20 and directional light devices 22, 24 of the assembly guide system 10 are programmed as to the proper spatial positioning to where an indicating light 46, 52 is to be projected. This teaching of the assembly guide system 10 may be accomplished in various ways. For example, one teaching method involves the use of known pendant device technology, where the pendant device is used to position the projected beam of the light source 66 to a proper location, such as a storage location 70, record the coordinates, and then move to the next location, such as onto the work piece 14. Control module may also be adapted to employ voice activated programming. Alternatively,

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a wireless transmitter may be used that may be positioned at a desired impingement point of the projected indicating light 46, 52 and functional to transmit the spatial positioning information to the control module. Similarly, various locations, such as part bins, may be provided with wireless transmitters, such as RFID tags, with the control module being adapted to detect the signal and direct the indicating lights accordingly, in which case the operational guide system is able to compensate for movement or shifting of the desired impingement points of the indicating lights. Still further, control module 20 may be directly programmed and, for example, may utilize a touch screen having an image of the work station with the control module 20 being programmable using the touch screen. An operational guide system may also alternatively be programmed via a computer, such as desktop or laptop or networked computer, without the above noted peripheral equipment and using standard hardware such as a mouse to program the control module. The operational guide system may also employ an alignment test pattern that may be used to "calibrate" the system, such as at the beginning of a shift, to insure that the various indicating light signals are properly aimed.

[0066] Guide system 10 also includes cycle time monitoring with display device 36 including display fields which may be used to display to an operator the running time or remaining allowable time associated with performance of an operational step, previous running times, average running times, and/or target times for completion of the operational steps. For example, cycle time monitoring display fields may show the cycle time to perform one or more previous or completed operational steps, while cycle time monitoring display field and/or shows the cycle time of the preceding and current operational cycle. A cycle time measurement may, for example, be initiated upon receipt of a first input signal 42 from sensor apparatus 26, and completed upon detection of a confirmation signal 48, 56, 84. Cycle time measurements of given operations or steps may be recorded and statistically reviewed, such as based on longest to shortest duration, and may be viewed remotely from guide system 10, such as by connecting guide system 10 with a networked computer system.

[0067] As previously noted, control module 20 may also be used to monitor and record various parameters useful for improving productivity. For example, control module 20 may record cycle times of the individual operational steps at a work station 16 and/or the combined cycle time of operations at a work station 16. Correspondingly, control module 20, or another such computational device, may record and provide charts or reports regarding recorded error data, such as on mis-performed steps, and/or cycle times. In addition, such data may be

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linked or otherwise networked, or even monitored via the internet, such that the variously above noted cycle times or performance parameters may be monitored from a remote computer, with such data being viewable in a live format or archived.

[0068] Although not shown, it should also be appreciated that the operational guide system may be adapted to additionally provide audio guidance and/or instruction, such as voice or sound type instruction.

[0069] It should be appreciated that numerous alternative structures and methods are contemplated within the scope of the operational guide system. For example, an operational guide system need only utilize a single directional light device for projecting indicating lights at both a component location as well as operational step locations on a work piece. An operational guide system also need not employ a component location, but rather may employ one or more tools with directional light devices functioning to project indicating lights at the various tools. Furthermore, it should also be appreciated that the assembly guide system 10 of FIGS. 1 and 2 may be alternatively constructed whereby the various links are not formed by computer cables or the like, but are rather formed as wireless connections between the various devices. Still further, each assembly step need not involve both the selection of a part and the assembly of the part to a work piece.

[0070] Operational guide systems may also be incorporated into assembly line systems with the guide systems simultaneously moving along with the item or device being assembled or constructed on the assembly line.

[0071] The operational guide system may also be configured for use with a stand alone work station as opposed to a work station integrated into an assembly line as shown in FIG. 1.

[0072] It should also be appreciated that numerous alternative uses and/or configurations of the operational guide system exist. For example, an operational guide system may be used to pick and package products into a shipping container, such as a bag or box, for fulfilling an order, such as part kitting at order fulfillment centers, supermarkets, part bin loading, assembly line sequencing, product changeovers, or the like. The operational guide system may also be used in a food production or preparation process in which, for example, the indicating lights may be projected onto sequentially required ingredients and may be timed depending upon when a particular ingredient is to be added.

[0073] FIG. 3 discloses an improved operational guide system 200, where guide system 200 shares similar components or elements with guide system 10, such that not all of the specific

Amazon Ex. 1002.0148

construction and alternatives are discussed with regard to guide system 200. Guide system 200 is integrated or interfaced with an operational program system or operational software system or manufacturing execution system (MES) 205 whereby operational software system 205 may provide operational guide system 200 with input signals or data inputs 207 to create, control or cause the projector of operational guide system 200 to project specific display images 209 via the projected indicating light 252 and/or project in specific locations. Manufacturing, production, and/or assembly environments frequently employ operational software systems 205, which are sometimes referred to as enterprise resource planning (ERP) systems, used in association with product planning, production scheduling, inventory control, and the like. These systems are generally defined as control systems for managing and monitoring work-in-process in a factory environment, such as on a factory floor. Examples of such operational software systems include, but are not limited to, SAP ® business software provided by SAP AG of Germany, PROPLANNER ® business software provided by Proplanner Corp. of Iowa, USA, as well as systems such as General Motor Corporation's Global Enterprise Production Information and Control System (GEPICS). Such operational software systems 205 can include data that may be utilized by guide system 200 to assist in guiding the activities of an individual without the necessity of having such information separately programmed or pre-programmed into guide system 200. For example, operational software system 205 may include part or component information, such as bill of material (BOM) information, including information categorized by part or product for separate operational steps in an assembly operation or the like, including part numbers and/or part descriptors, that may be transmitted to guide system 200. Operational software system 205 may also include ordered operational process descriptions as used, for example, for time and cost analysis purposes, which information may also be transmitted to guide system 200. Operational software system 205 may still further include images of parts, components, decals, labels and the like that may be transmitted to guide system 200.

[0074] Accordingly, operational software system 205 may be interfaced with operational guide system 200 as shown in FIG. 3 whereby the data transmitted by operational software system 205 may be directly projected by guide system 200 or used in combination with information programmed into guide system 200 to project indicating lights 246 to create desired images 209. Data inputs 207 transmitted by operational software system 205, such as to a control module or controller or guide controller 220 of guide system 200, may be used to

Amazon Ex. 1002.0149

create numerous display images 209, including part numbers, part descriptions, work instructions and/or graphics, such as images of parts, decals, or label. As discussed above with regard to the embodiment of FIG. 1, controller 220 includes software for controlling operation of guide system 200, with controller 220 receiving inputs from operational software system 205 directing use and placement of VDFs. For example, data inputs 207 transmitted from operational software system 205 related to part information may be projected or used by guide system 200 to project a particular part number for display to an operator and/or may trigger guide system 200 to project a display image at a particular location wherein a desired part is stored. Data inputs 207 from operational software system 205 related to sequential operational process descriptors may be projected or used to project step-by-step work instructions to an operator for accomplishing a particular task. Graphical data inputs 207 from operational software system may be projected or used by guide system 200 to project a depiction of a part, label, or decal, which may, for example, be displayed to help an individual correctly identify and/or position a particular item. Moreover, the data inputs 207 from operational software 205 may be used and projected with or combined with standard or programmed images, such as images illustrated in FIGS. 1A-1L.

[0075] Referring now to FIG. 3A in connection with the operation of guide system 200, controller 220 is illustrated to include a VDF address table or listing 286, as well as numerous positional identifiers 288 contained in an address table or matrix or positional listing 289. Controller 220 includes numerous pre-programmed VDFs that are each assigned a unique identifier 287, which in the illustrated embodiment for exemplary purposes comprises a horizontal axes with letters "A" to "H" and a vertical axes with the numerals "1" to "7". For example, the textual VDF "Select 1" is associated with the address identifier A1, and the textual VDF "Part 6" is associated with the address identifier F6. In addition to textual VDFs, VDF address table 286 includes images (see A2 to H2), videos (see A4 to H4), and drawings (see A5 to H5). The videos and drawings in FIG. 3A are identified with brackets for explanation purposes, but should be understood that when projected, such as by a projector 266, would form a visual indicator comprising an image, video or drawing, such as a picture or blueprint, on the projection surface. Each unique VDF contains unique characteristic and combination of characteristics including, but not limited to, color, font size, font type, width, height, rotation angle, animation type, alphanumeric code, etc.

Amazon Ex. 1002.0150

[0076] In the illustrated embodiment positional listing 289 includes positional identifiers or addresses 288 associated with three separate physical objects, with the objects being identified or represented within positional listing 289 of controller 220 as canvas A, canvas B and canvas C. As shown in the illustrated embodiment, canvas A is associated with positional identifiers PA1 to PA9, canvas B is associated with positional identifiers PB1 to PB16, and canvas C is associated with positional identifiers PC1 to PC16. As described in more detail below, in the illustrated embodiment guide system 200 includes three projectors 266a, 266b, 266c, with each projector being used to project light to form VDFs on the three separate physical objects. The various positional identifiers 288 in listing 289, therefore, represent a location, such as by X, Y, Z spatial coordinates, on the physical object to which a projector and VDFs would be directed. Accordingly, controller 220 is programmed with the locations of nine positions on the physical object associated with canvas A (PA1 to PA9), with the locations of sixteen positions on the physical object associated with canvas B (PB1 to PB16), and with the locations of sixteen positions on the physical object associated with canvas C (PC1 to PC16). Guide system 200 may be taught the positional identifiers in any of the manners discussed above, for example, or utilizing other techniques. Furthermore, multiple projectors may be utilized for each physical object as necessary, with each projector responsible for a specific canvas, or area on the object, and associated positional identifiers.

[0077] With reference to the embodiment of FIG. 3B, three separate physical objects are disclosed, including a parts rack 290, a movable sequence rack 291 that is used to transport parts between parts rack 290 and a vehicle 292, such as may be located on an assembly line. With reference to FIG. 3A, parts rack 290 is the physical object associated with canvas A, sequence rack 291 is the physical object associated with canvas B, and vehicle 292 is the physical object associated with canvas C. Further, projector 266a is utilized to project VDFs onto parts rack 290, projector 266b is utilized to project VDFs onto sequence rack 291, and projector 266c is utilized to project VDFs onto vehicle 292. Parts rack 290 contains nine separate parts bins for containing different parts, with each bin labeled in brackets in FIG. 3B as Part 1 to Part 9 for explanation purposes. It should be understood that this bracketed labeling does not represent the projection of a VDF onto parts rack. Sequence rack 291 includes sixteen separate storage locations within which parts may be stored for sequential assembly to vehicle during assembly. Moreover, the nine positional identifiers PA1 to PA9 associated with canvas A correspond to the physical location of each of the nine separate parts

Amazon Ex. 1002.0151

bins of parts rack, and the sixteen positional identifiers PB1 to PB16 associated with canvas B correspond to the physical location of each of the sixteen storage locations of sequence rack.

[0078] Thus, in operation, guide system 200 may be prompted to project a particular VDF based on an address identifier 287 onto a surface of a particular object based on a positional identifier 288, with the projected VDF thereby forming a visual indicator on the object. With reference to the embodiment of FIG. 3B, for example, the VDF "Select 3" of address identifier C1 is projected by projector 266a onto parts rack at positional locations associated with the positional identifiers of PA2, PA3 and PA7 to prompt an operator to select three of each of Part 2, Part 6 and Part 7, respectively. Likewise, the VDF "Select 1" of address identifier A1 is projected by projector 266a onto parts rack at the positional location associated with the positional identifier of PA3 to prompt an operator to select a single one of Part 3.

[0079] Subsequent to the selection of a particular part, an operator may be prompted to place the selected part into particular storage locations on sequence rack 291. For example, the VDF "Part 2" of address identifier B6 is projected by projector 266b onto storage locations on sequence rack at the positional locations associated with the positional identifiers of PB1, PB3 and PB6 to create visual indicators and prompt the operator to place one each of the three selected Part 2 type of part into the three separate indicated storage locations. Similarly, the VDF "Part 3" of address identifier C6 is projected by projector 266b onto the storage location of sequence rack 291 at the positional location associated with the positional identifier PB7 to prompt the operator to place the selected Part 3 type of part into the indicated storage location.

[0080] Still further, guide system 200 may subsequently be utilized to aid in the assembly of the parts placed within sequence rack 291 onto vehicle 292, as well as perform additional assembly operations on vehicle 291. For example, VDFs associated with address identifiers B6, C6, D6, F6, G6 and H6 may be projected by projector 266c onto specific locations on vehicle 292 where at the particular selected part is to be assembled in the sequence associated with their storage on sequence rack, with the positional locations for assembly to vehicle 292 being defined by the positional identifiers PC1 to PC16. Still further, additional VDFs may be projected onto vehicle 292, such as are listed as A3 to F3 in VDF address table 286, for example, to direct inspection, alignment, masking or other such operations.

[0081] It should be appreciated that confirmation signals may be provided with regard to verification that the various activities undertaken by an operator as prompted by guide system

Amazon Ex. 1002.0152

200 were properly completed, such as in the manner disclosed above with respect to guide system 10, such as by a confirmation module. For example, parts rack 290 and/or sequence rack 291 may provide confirmation signals by way of machine vision systems, light curtains, push buttons, as well as spatial recognition systems. Similarly, operations associated with vehicle 292 may similarly be confirmed.

[0082] Accordingly, guide system 200 may be dynamically used to project selected VDFs onto particular locations of an object by selecting a VDF via its associated VDF address identifier 287 and directing a projector 266 to project the selected VDF by a positional identifier 288. This operational approach simplifies the use and employment of guide system 200 by enabling flexible programming to guide system 200, including as may be required due to product and model changes.

[0083] In the embodiment of FIG. 3, data inputs 207 are employed to coordinate the selection of VDFs based on the associated address identifier, as well as the positional location of where the VDF is to be projected based on the positional identifier. Referring now to FIG. 3C, the interface of operational software 205 with the controller 220 of guide system 200 is illustrated. A communication link 293 between system 205 and controller 220 is used for the exchange of data, with communication link 293 comprising a standard communication protocol such as TCP/IP or the like. Controller 220, which includes hardware and software, includes an application program 294 for interfacing with the operational software 205, where application program 294 may be customized based on the specific type or program of operational system 205 employed. Also included is a guide system program 295, with guide system program 295 including the above noted address table 286 and positional listing 289. In one embodiment application program 294 and guide system program 295 may interact via an application programming interface (API) such as Windows Communication Foundation (WCF). Accordingly, guide system program 295 of guide system 200 can be utilized with multiple different operational software systems 205 based on the customization of application program 294 for the particular operational software system 205 employed. Data inputs or signals to controller 220, such as signals representing part numbers, product model numbers, operational steps, and the like, are interpreted by controller 220 via application program 294 and guide system program 295 to cause the proper selection of a VDF based on the address identifier and project it at the appropriate location based on the positional identifier.

Amazon Ex. 1002.0153

[0084] As previously noted, operational systems 205 may include detailed information regarding production processes, including the location and status of particular objects being assembled, as well as the parts required to be assembled. For example, operational software systems 205 can track the model and location of a vehicle on an assembly line and thereby interact with guide system 200 in the manner described above to coordinate the providing of the appropriate components and assembly actions. Thus, operational software system 205 may provide data streams of input signals 207 to guide system 200 to enable desired VDFs to be projected at desired locations. Interfacing guide system 200 with operational software system 205 reduces the amount of separate programming required for guide system 200, as well as enables real time or dynamic creation of visual indicators or display images 209 for guiding the activities of an individual. Thus increasing the flexibility of guide system 200 based on changing operational requirements of an assembly, inspection or other process requiring guidance assistance via guide system 200.

[0085] With further reference to FIG. 3, a sensor apparatus 226 may be provided, such as sensor apparatus 26 described above in reference to FIGS. 1 and 2, that may be used for triggering or sending data inputs to guide system 200 for part selection and/or confirmation. For example, upon activation of guide system 200 to perform a particular guidance procedure based on detection of a component or required assembly or inspection steps, sensor apparatus 226 may transmit a signal 211 to operational software system 205 identifying the particular component or required assembly steps pending at guide system 200. Operational software system 205 may then transmit data inputs 207 based on signal 211. Alternatively, in response to an input signal 242 transmitted by sensor apparatus 220 to guide system 200, such as to a control module of guide system 200, guide system 200 may send a signal 213 to operational software system 205 triggering the transmission of data inputs 207 to guide system 200 based on the particular component or required assembly or inspection steps pending at guide system 200. Still further, operational software system 205 and guide system 200 may be integrated or interfaced in such a manner that data within operational software system 205 is provided to or resides within guide system 200 without the need for triggering signals. As noted, sensor apparatus 226 may be a sensor apparatus component of guide system 200. Alternatively, sensor apparatus 226 may be a separate component, such as a device that detects the presence and/or type of product at guide system 200, or may be a device such as a computer for allowing manual inputs.

Amazon Ex. 1002.0154

[0086] Although described above in regard to the assembly of a vehicle, it should be appreciated that guide system 200 may be employed with numerous alternative processes, including assembly, inspection, sequencing, product changeover, welding, stamping, part kitting, and the like. Moreover, the guide system may include fewer or substantially more VDFs, with each having its own address identifier, as well as include additional positional identifiers. It should be further understood that numerous alternative VDFs may be employed, as well as that multiple VDFs may be simultaneously projected or projected sequentially as desired. For example, a VDF may be projected to form a visual indicator that traces a route along an object, as well as traces a route along an object at a particular speed. Such a visual indicator may be used, for example, to aid in the application of an adhesive onto the object by enabling an operator to follow the indicator to place the adhesive in the appropriate location, as well as in the proper amount based on the speed of the projected visual indicator. Still further, a guide system may include fewer or more projectors and/or enable a single projector to project onto multiple physical objects.

[0087] Although shown in connection with an operational software system in FIGS. 3 and 3C, it should be further appreciated that guide system 200 may be employed utilizing an addressed VDF listing 286 and positional identifiers 288 without an operational software system 205 and/or without a system controller as described below. In such embodiments, guide system controller 220 may be programmed by selecting VDFs to be projected based on the VDF address identifiers and the positional identifiers corresponding to the locations on a physical object, thereby providing substantial flexibility to the programming of guide system controller 220. In such an embodiment, guide system controller 220 may receive input signals directly from a sensor apparatus and/or via manual inputs from an operator.

[0088] Still further, as illustrated in FIG. 3D, guide system controller 220 may be configured for operations through a system controller 296, such as a PLC device, where the system controller 296 may operate to control an automated process, such as an assembly line 18, and provide input signals 207 to controller 220. In such an arrangement system controller 296 may communicate with controller 220 via an I/O fieldbus interface. For example, system controller 296 may receive signals 297 from a sensor apparatus, such as a bar code reader or the like, as described above in connection with system 10, and in turn provide an input signal 207 to guide system controller 220 to prompt the projection of a VDF based on an address identifier 287, at a particular physical location based on a positional identifier 288. It should

Amazon Ex. 1002.0155

be appreciated that application program 294 and/or guide system 295 may operate to parse or interpret the data inputs 207 to prompt selection of the appropriate address identifier and positional indicator. An alternative system controller may be employed comprising a software system, such as a soft-PLC or visual logic controller (VLC) software, or the like for example, in which case a hardware system employed with a conventional PLC device may not be required. In such a software based application the system controller may reside and operate on the guide system controller 220.

[0089] In turn, as illustrated in FIG. 3D, an operational software system 205 may provide communications to a system controller 296 that is utilized to control operation of an automated process, such as assembly line 18, as well as guide system 200. It should be appreciated with respect to FIG. 3D, however, that guide system 200 may be controlled and interact with system controller 296 without utilizing an operational software system 205. For example, system controller 296 may receive signals 297 with regard to an operational process, such as via a bar code or data reader or other such sensor, with the PLC in turn providing input signals 207 to guide system controller 220 of guide system 200 based on such signals, and with the input signals 207 being parsed or interpreted by the guide system control 220 to define the appropriate addressed VDF and positional identifier.

[0090] Thus, it should be understood that guide system controller 220 of guide system 200 may receive input signals triggering the selection of address identified VDFs and positional identifiers for directing the projection of the selected VDFs onto a desired location of a physical object from a variety of equipment, controllers and systems. For example, the input signals may be provided to the controller 220 directly from an operational system 205, where the operational system 205 may itself receive signals from a sensor apparatus 226 and the input signal provided by the operational system 205 are based on the signals received by the operational system 205 from the sensor apparatus 226. Input signals triggering such projection by guide system 200 may also or alternatively be provided directly to guide system controller 220 by a sensor apparatus 226. Still further, a system controller 296 may provide input signals triggering projection, including via the system controller 296 receiving signals from a sensor apparatus 226. It should further be appreciated that in like manner to system 10, guide system 200, including whether used as a stand alone system or in connection with a system controller 296 and/or a manufacturing execution system 205, may receive confirmation signals upon completion of an activity directed by a projected visual indicator,

Amazon Ex. 1002.0156

such as via the above noted techniques, including via a confirmation module 228. That is, confirmation signals may be provided directly to guide system controller 220, such as via a confirmation module 228 and/or confirmation signals may be provided to guide system controller 228 from a system controller 296 and/or an operational system 205. These various alternatives regarding input signals, confirmation signals, a sensor apparatus 226, and a confirmation module 228 are schematically illustrated in FIG. 3E, wherein it should be appreciated that the system controller 296 and/or operational system 205 may be omitted.

[0091] Referring now to FIG. 4, an operational guide system 300 is illustrated, where guide system 300 shares similar components or elements with guide system 10, such that not all of the specific construction and alternatives are discussed with regard to guide system 300. Guide system 300 includes an integrated camera device 313 that may be used to record and/or review activities by an individual being guided by guide system 300, as well as the object that is the subject of activities by the individual. Camera 313 may be a digital camera for still pictures or a video recorder, such as a webcam or a high definition video camera recorder, including a video camera capable of capturing still images. Images or videos captured by camera 313 may be recorded or stored in guide system 300 and subsequently viewed on a display device 336 of guide system 300 and/or on a separate display device remote from guide system 300, such as via a computer network. Such images or videos may be used for numerous process analysis purposes, including to develop process improvements, such as facilitating assembly steps, determine or investigate why certain operational steps exceeded a desired cycle time, and monitor causes of downtime. Images recorded by camera 313 may also be viewed in combination with recorded cycle time data to review the recorded process steps and determine corrective actions to optimize the process and/or reduce cycle times.

[0092] Still further, recorded and/or real time images from camera 313 may be viewed remotely from guide system 300, such as by interfacing guide system 300 with a monitor 315, where monitor may be (part of) a computer 317, for example, integrated with guide system 300 through an intranet or internet connection, including via a wireless connection. Computer 317 may also be used to control various aspects of guide system 300, including camera 313 and a directional light device 322 having a projecting light source. For example, in one scenario guide system 300 may be used as part of a remote training session whereby a trainer remotely located from guide system 300 may train one or more students at a remote training station utilizing guide system 300. In such a scenario, the surgeon may view with computer

317 the object being worked on by the students via camera 313. The trainer may then control directional light device 322 by a light controller 319, such as a joystick, to project an indicating light onto a particular location of the object at the training station for directing activities of the students. In such an embodiment, guide system 300 may also include a camera controller 321, such as a separate joystick or the like, whereby the surgeon may also control aspects of the camera 313, such as the camera's viewing position, focus, and zoom. Although light controller 319 and camera controller 321 are illustrated as separate components, it should be understood that computer 317 may be used to control the directional light device and/or camera 313 without separate components. In another scenario, camera 313 may be used by a technician or engineer during programming of guide system 300, such as to program a new assembly step whereby the camera 313 would allow the programmer to view, for example, the work station and any associated part bins and properly direct the projection of an indicating light by directional light device 322.

[0093] Camera 313 may be a separately mounted camera, such as at a fixed position or mounted for movement, such as by servo motors. Still further, camera 313 may be integrated with the directional light projecting devices.

[0094] Referring now to FIGS. 5A and 5B, a directional light device 22 having a light projector 66 is illustrated relative to work station 16, such as shown with reference to operational guide system 10 and work station 16 of FIG. 1, where indicating lights projected by the light device 22 are directed at a projection surface or screen 71. Projection surface 71 allows individuals to view display images 209 projected onto surface 71 when the individuals are located on the opposite side of projection surface 71, such as when an individual is standing at work area 77, relative to directional light device 22 and may be utilized, for example, in locations in which a light projector is constrained from projecting indicating lights without being blocked by an operator or additional equipment or by components located at the work station. Images 209 projected onto a back surface or rear surface 73 of projection surface 71 are viewable by an operator stationed at work station 16 when the operator views the front surface 75 of projection surface 71 such that the operator may see and read display images 209, such as words, pictures, or videos, for guiding activities at work station. Projection surface 71 may be constructed from a conventional rear projection screen.

[0095] FIG. 5C illustrates an alternative embodiment in which projection surface 71 is mounted to work station 16 with light device 22 and light projector 66 mounted from beneath.

Amazon Ex. 1002.0158

In the embodiment of FIG. 5C, an operator stationed at work station 16 views on front surface 75 display images 209 projected on back surface 73. As illustrated, projection surface 71 may be angled or angularly inclined, such as in the range of approximately 20 to 25 degrees relative to a horizontal plane, for ease of viewing by the operator.

[0096] Although projection surface 71 described above is constructed as a rear projection screen, it should be appreciated that in an alternative embodiment a projection surface may be employed in which a directional light projection device projects images directly onto the surface viewed by an individual as opposed to the rear surface. In such an embodiment, the directional light projection device may be located above or to the side of the individual being guided.

[0097] With reference to FIG. 6, an operational guide system 400 may also be constructed to include one or more three dimensional spatial motion sensors 423 for monitoring activities of an operators body, hand, etc. and/or other surfaces related to robots, workstation hardware such as fixtures, part bins, etc. to confirm that desired operational steps are properly accomplished. Sensor 423 may, for example, be used to or as part of monitoring that particular parts were properly selected from the correct bins and placed for part kitting purposes or assembled to a work piece. Sensor 423 may additionally function as a confirmation module, such as confirmation module 28 discussed above, to provide output confirmation signals 456 comprising data related to the detected motion sensed by sensor 423, such as to guide controller or guide control module 420, where the detected motion data may be compared to predetermined required motions or actions to thereby aid in indicating or determining that the operational step indicated by the directional light device of guide system 400 has been properly completed. Alternatively, motion sensor 423 may itself include processing capability for comparing detected motion to a predetermined desired action to thereby provide a confirmation signal 456 if the guided action has been properly completed. In situations where the motion detected by sensor 423 does not match a predetermined action a signal may be transmitted, such as by a guide system controller or the sensor itself, indicating as such.

[0098] Sensor 423 may, for example, employ Microsoft Corporation's KINECT three dimensional spatial motion sensor technology, which utilizes a three dimensional infrared laser projector and a monochrome CMOS sensor for analyzing depth, as well as a separate RGB video camera. Details of such technology may be disclosed in U.S. Pat. Nos. 7,763,841

Amazon Ex. 1002.0159

titled OPTICAL COMPONENT FOR A DEPTH SENSOR and 6,963,060 titled PHOTO-SENSOR ARRAY FOR MOTION DETECTION, the disclosures of which are incorporated herein by reference. However, it should be understood that alternative three dimensional spatial motion sensor technology may be employed with sensor 423. Still further, sensor 423 may include a camera that is additionally utilized to record and/or review activities by an individual being guided by guide system, such as camera 313 of guide system 300 of FIG. 7. Accordingly, it should be appreciated that the sensor 423 of guide system may be used for process analysis purposes, remote user interface and/or programming purposes, as well as for confirmation of proper completion of guided operations.

[0099] FIG. 7 illustrates an operational guide system 500, which may be any of guide systems 10, 200, 300 or 400 described above, in operation simultaneously providing indicating lights to guide activities of multiple individuals 512a, 512b, 512c, 512d. As illustrated, guide system 500 includes a single controller 520 with multiple projectors 566a, 566b, 566c, 566d and multiple sensor apparatuses 526a, 526b, 526c, 526d. Each projector 566 may be used to guide one or more actions by a separate individual 512, where the actions for each individual 512 may be guided completely separate or independently of the guiding of actions for the other individuals. For example, if each individual 512 is performing the same task, but each individual performs the task at a different rate, guide system 500 can accommodate such variation and allow each individual to initiate, perform, and finalize their activities separately from one another. Alternatively, one or more of the individuals 512 may be directed by guide system 500 to perform separate tasks requiring different guided activities that may be initiated, performed, and completed independently from the guided activities for the other individuals. Accordingly, operational guide system 500 may be provided with, as shown, separate sensor apparatuses 526a, 526b, 526c, 526d and/or confirmation modules 528a, 528b, 528c, 528d associated with each individual 512a, 512b, 512c, 512d, respectively. Furthermore, these system improvements may also be used by guide system 500 to project the VDFs required to guide process steps for multiple individuals from one projector rather than multiple projectors.

[00100] Operational guide systems 200, 300 and 400 of FIGS. 3-6 may be similarly constructed to operational guide system 10 discussed above, with similar components to operational guide system 10 being identified with 200, 300 and 400 added to the reference

Amazon Ex. 1002.0160

numerals of guide system 10, and such that not all of the details of similar features are discussed with reference to guide systems 200, 300 and 400.

[00101] In addition, guide systems in accordance with the present invention may include a conditional programming methodology whereby the guide system controller enables and/or provides a user, system controller, or manufacturing execution system to re-direct the guide system based on a signal received by the guide system controller. For example, if a sensor apparatus detects that a guided operation was missed or not done properly, the guide system may provide specific remedial guidance based on that detection. Examples include, but are not limited to, rework requirements, help information, and missing parts options. If, for example, a vision system sensor detects that a part is missing or a gauge tool sensor detects that a part is out of specification, guide system may provide remedial guided actions to correct the error.

[00102] The guide system of the present invention thus is readily programmable and adaptable to provide a cost effective and accurate method of guiding an individual through a series of tasks and/or provide confirmation that the tasks have been properly completed.

[00103] Changes and modifications in the specifically described embodiments can be carried out without departing from the principles of the present invention which is intended to be limited only by the scope of the appended claims, as interpreted according to the principles of patent law including the doctrine of equivalents.

Amazon Ex. 1002.0161

PTO-1390 (05-13)
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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371

Attorney Docket No.	
RYZ01 P-101A	
U.S. Application No. (if known, see 37 CFR 1.5)	

International Application No.	International Filing Date	Priority Date Claimed
PCT/US2012/024730	February 10, 2012	February 11, 2011

Title of Invention
LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

First Named Inventor
Paul Ryznar et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☑ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☑ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☑ is attached.
   b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☑ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☑ A preliminary amendment.
11. ☑ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☐ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821-1.825.
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: _____
16. ☐ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. APPLN. No. (if known – see 37 CFR 1.5)	INTERNATIONAL APPLICATION No.	ATTORNEY DOCKET No.
	PCT/US2012/024730	RYZ01 P-101A

17. ☐ Other items or information:

The following fees have been submitted.	CALCULATIONS	PTO USE ONLY
18. ☑ Basic national fee (37 CFR 1.492(a)) **$280**	$ 280.00	
19. ☑ Examination fee (37 CFR 1.492(c)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** All other situations **$720**	$ 720.00	
20. ☑ Search fee (37 CFR 1.492(b)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority ..... **$120** International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB ..... **$480** All other situations **$600**	$ 480.00	
TOTAL OF 18, 19, and 20 =	$ 1480.00	
☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)). Fee for each additional 50 sheets of paper or fraction thereof **$400**		

Total Sheets	Extra Sheets	Number of each addition 50 or fraction thereof (round **up** to a whole number)	RATE	
- 100 =	/ 50 =		x **$400**	$

Surcharge of **$140.00** for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	23 - 20 =	3	x **$80**	$ 240.00	
Independent claims	2 - 3 =	0	x **$420**	$ 0.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			**+ $780**	$	
Processing fee of **$140.00** for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)). **+**				$	
TOTAL OF ABOVE CALCULATIONS =				$ 1720.00	
☑ **Applicant asserts small entity status.** See 37 CFR 1.27. Fees above are reduced by ½.					
☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.					
TOTAL NATIONAL FEE =				$ 860.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property. **+**				$	
TOTAL FEES ENCLOSED =				$ 860.00	
				Amount to be refunded:	$
				Amount to be charged:	$

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a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $_____ to cover the above fees.

c. ☑ The Director is hereby authorized to charge additional fees which may be required, or credit any overpayment, to Deposit Account No. 505553 as follows:

i. ☑ any required fee.

ii. ☐ any required fee except for excess claims fees required under 37 CFR 1.492(d) and (e) and multiple dependent claim fee required under 37 CFR 1.492(f).

d. ☑ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

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NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Correspondence Address

☑ The address associated with Customer Number: 15671 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone			
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Signature	/Karl T. Ondersma/	Date	August 9, 2013
Name (Print/Type)	Karl T. Ondersma	Registration No. (Attorney/Agent)	55894

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
13/984,744	Paul Ryznar	RYZ01 P-101A

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02/10/2012	02/11/2011

CONFIRMATION NO. 1049
371 FORMALITIES LETTER



Date Mailed: 08/22/2013

Notification of Insufficient Fees (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as a Designated Office (37 CFR 1.494):

- Indication of Small Entity Status
- Priority Document
- Copy of the International Application filed on 08/09/2013
- Copy of the International Search Report filed on 08/09/2013
- Preliminary Amendments filed on 08/09/2013
- Information Disclosure Statements filed on 08/09/2013
- Oath or Declaration filed on 08/09/2013
- Request for Immediate Examination filed on 08/09/2013
- U.S. Basic National Fees filed on 08/09/2013
- Specification filed on 08/09/2013
- Claims filed on 08/09/2013
- Abstracts filed on 08/09/2013
- Drawings filed on 08/09/2013

Applicant has requested early processing under 35 U.S.C. 371(f) but processing can not proceed until all missing requirements are furnished.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Additional claim fees of $**240** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.

SUMMARY OF FEES DUE:

Total additional fees required for this application is $**240** for a Small Entity:

Total additional claim fee(s) for this application is $**240**
- $**240** for **9** total claims over 20.

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION, WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.

Amazon Ex. 1002.0166

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

PAULETTE R KIDWELL

Telephone: (571) 272-0398

Amazon Ex. 1002.0167

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
13984744	

Applicant(s) Paul Ryznar

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT	
	Indep	Depend	Indep	Depend	Indep	Depend
1	1		1			
2		1		1		
3		2		1		
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6		2		1		
7		2		1		
8		2		1		
9		1		1		
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11		1		1		
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Total Indep	4		2		0	
Total Depend	31	↵	21	↵	0	↵
Total Claims	35		23		0	

	*		*		*	
	Indep	Depend	Indep	Depend	Indep	Depend
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/984,744

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	140		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	240		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	29 minus 20 =	* 9	x 40 =	360	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1100		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/984,744	08/09/2013		860	RYZ01 P-101A	29	3

CONFIRMATION NO. 1049

15671
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr.
SE, Suite 207
Grand Rapids, MI 49546

FILING RECEIPT

OC000000063334723

Date Mailed: 08/22/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Paul Ryznar, Northville, MI;
James Ryznar, Belleville, MI;

Applicant(s)

Paul Ryznar, Northville, MI;
James Ryznar, Belleville, MI;

Assignment For Published Patent Application

OPS SOLUTIONS LLC, Northville, MI

Power of Attorney: The patent practitioners associated with Customer Number 15671

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US12/24730 02/10/2012 *
which claims benefit of 61/441,897 02/11/2011
(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 08/19/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/984,744**
Projected Publication Date: 11/28/2013
Non-Publication Request: No

Amazon Ex. 1002.0170

Early Publication Request: No
**** SMALL ENTITY ****
Title

LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

Amazon Ex. 1002.0171

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/984,744

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	140		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	240		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	29 minus 20 =	* 9	x 40 =	360	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1100		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/984,744	08/09/2013		860	RYZ01 P-101A	29	3

CONFIRMATION NO. 1049

15671
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr.
SE, Suite 207
Grand Rapids, MI 49546

FILING RECEIPT

OC000000063430161

Date Mailed: 08/29/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Paul Ryznar, Northville, MI;
James Ryznar, Belleville, MI;

Applicant(s)

Paul Ryznar, Northville, MI;
James Ryznar, Belleville, MI;

Assignment For Published Patent Application

OPS SOLUTIONS LLC, Northville, MI

Power of Attorney: The patent practitioners associated with Customer Number 15671

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US12/24730 02/10/2012 *
which claims benefit of 61/441,897 02/11/2011
(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 08/19/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/984,744**
Projected Publication Date: 12/05/2013
Non-Publication Request: No

Amazon Ex. 1002.0174

Early Publication Request: No
**** SMALL ENTITY ****
Title

LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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Amazon Ex. 1002.0175

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
13/984,744	Paul Ryznar	RYZ01 P-101A

15671
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr.
SE, Suite 207
Grand Rapids, MI 49546

INTERNATIONAL APPLICATION NO.	
PCT/US12/24730	
I.A. FILING DATE	PRIORITY DATE
02/10/2012	02/11/2011

CONFIRMATION NO. 1049
371 ACCEPTANCE LETTER

OC000000063430162

Date Mailed: 08/29/2013

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

08/09/2013	08/09/2013
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS	DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** *The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363).* Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 08/09/2013
- Copy of the International Search Report filed on 08/09/2013
- Preliminary Amendments filed on 08/09/2013
- Information Disclosure Statements filed on 08/09/2013
- Oath or Declaration filed on 08/09/2013
- Request for Immediate Examination filed on 08/09/2013
- U.S. Basic National Fees filed on 08/09/2013
- Specification filed on 08/09/2013
- Claims filed on 08/09/2013
- Abstracts filed on 08/09/2013
- Drawings filed on 08/09/2013

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Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

PAULETTE R KIDWELL

Telephone: (571) 272-0398

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United States Patent and Trademark Office
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U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
13/984,744	Paul Ryznar	RYZ01 P-101A

15671
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr.
SE, Suite 207
Grand Rapids, MI 49546

INTERNATIONAL APPLICATION NO.	
PCT/US12/24730	
I.A. FILING DATE	PRIORITY DATE
02/10/2012	02/11/2011

CONFIRMATION NO. 1049
371 WITHDRAWAL NOTICE

OC000000063402320

Date Mailed: 08/29/2013

Letter Regarding a New Notice and/or the Status of the Application

If a new notice or Filing Receipt is enclosed, applicant may disregard the previous notice mailed on 08/22/2013. The time period for reply runs from the mail date of the new notice. Within the time period for reply, applicant is required to file a reply in compliance with the requirements set forth in the new notice to avoid abandonment of the application.

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If the reply is not filed electronically via EFS-Web, the reply must be accompanied by a copy of the new notice.

If the Office previously granted a petition to withdraw the holding of abandonment or a petition to revive under 37 CFR 1.137, the status of the application has been returned to pending status.

PAULETTE R KIDWELL

Telephone: (571) 272-0398

FORM PCT/DO/EO/WITH (371 Withdrawal Notice)

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Electronic Acknowledgement Receipt

EFS ID:	17271104
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma/Wendy Nance
Filer Authorized By:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	30-OCT-2013
Filing Date:	09-AUG-2013
Time Stamp:	17:00:52
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	01-Transmittal.pdf	59640 fc3d6c97fb927eb42e6371abf2763b7871e519b6	no	1

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	02-IDS.pdf	612044 de914c7982d8399994cdf88ab000a94b39db7840	no	4

Warnings:	
Information:	
Total Files Size (in bytes):	671684

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7463368	B2	2008-12-09	Morden et al.	
	2	7433796	B2	2008-10-07	Behan et al.	
	3	7193696	B2	2007-03-20	Engelbart et al.	
	4	6317980	B2	2001-11-20	Buck, III	
	5	5341183		1994-08-23	Dorsey-Palmateer	

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Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2013-10-30
Name/Print	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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Document Description: Transmittal Letter

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	13/984,744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☑ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Gardner, Linn, Burkhart & Flory, LLP		
Signature	Karl T. Ondersma		
Printed name	Karl T. Ondersma		
Date	October 30, 2013	Reg. No.	55894

CERTIFICATE OF TRANSMISSION/MAILING

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Signature	Wendy E Nance		
Typed or printed name	Wendy E. Nance	Date	October 30, 2013

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A

CONFIRMATION NO. 1049

15671
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

PUBLICATION NOTICE



Title:LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

Publication No.US-2013-0325155-A1
Publication Date:12/05/2013

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

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In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

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CONFIRMATION NO. 1049

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/984,744	08/09/2013 RULE	700	2126	RYZ01 P-101A

APPLICANTS

INVENTORS

Paul Ryznar, Northville, MI;
James Ryznar, Belleville, MI;

**** CONTINUING DATA ***************************

This application is a 371 of PCT/US12/24730 02/10/2012 *
which claims benefit of 61/441,897 02/11/2011
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
08/19/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /ANTHONY T WHITTINGTON/ Examiner's Signature	☐ Met after Allowance A.W. Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		MI	14	29	3

ADDRESS

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546
UNITED STATES

TITLE

LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

FILING FEE RECEIVED		
860	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	45	("4163309" | "7515981" | "3667104" | "4102568" | "20040111901" | "6317980" | "7433796" | "3986244" | "4222036" | "2682117" | "20060059699" | "5341183" | "7463368" | "20060185181" | "3600785" | "3623066" | "7193696").PN.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 09:42
L2	1410	700/95.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 09:44
L3	4526	G05B19/02	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 09:45
L4	3	L1 and "guide system"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 09:46
L5	2	L4 and "projector"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 09:46
L6	2	L5 and "controller"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 09:46
L7	394	"guide system" and "projector"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 10:07
L8	6	L7 and "visual indicator"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 10:08
L9	117	L7 and "controller"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 10:08
L10	87	L9 and "sensor"	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2015/10/06 10:09

			DERWENT			
L11	63	L10 and "camera"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 10:10
L12	18	L11 and "positional"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2015/10/06 10:10

10/6/2015 11:31:39 AM
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7463368	B2	2008-12-09	Morden et al.	
	2	7433796	B2	2008-10-07	Behan et al.	
	3	7193696	B2	2007-03-20	Engelbart et al.	
	4	6317980	B2	2001-11-20	Buck, III	
	5	5341183		1994-08-23	Dorsey-Palmateer	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Receipt date: 10/30/2013	Application Number	13984744	13984744 - GAU: 2126
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-08-09	
	First Named Inventor	Paul Ryznar	
	Art Unit	2127	
	Examiner Name		
	Attorney Docket Number	RYZ01 P-101A	

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Signature	/Anthony Whittington/	Date Considered	10/06/2015

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.W./

Receipt date: 10/30/2013	Application Number	13984744	13984744 - GAU: 2126
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2013-08-09	
	First Named Inventor	Paul Ryznar	
	Art Unit	2127	
	Examiner Name		
	Attorney Docket Number	RYZ01 P-101A	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2013-10-30
Name/Print	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.W./

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Paul Ryznar et al.
Art Unit	
Examiner Name	
Attorney Docket Number	RYZ01 P-101A

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7515981	B2	2009-04-07	Ryznar et al.	
	2	4222036		1980-09-09	Troukens	
	3	4163309		1979-08-07	Stuckler	
	4	4102568		1978-07-25	Miyagi	
	5	3986244		1976-10-19	Latanzi	
	6	3667104		1972-06-06	Chamillard et al.	
	7	3623066		1971-11-23	Norris	
	8	3600785		1971-08-24	Cook	

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Receipt date: 08/09/2013	Application Number	13984744 - GAU: 2126
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	
	First Named Inventor	Paul Ryznar et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RYZ01 P-101A

	9	2682117		1954-06-29	Wales	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060185181	A1	2006-08-24	Long et al.	
	2	20060059699	A1	2006-03-23	Krantz et al.	
	3	20040111901	A1	2004-06-17	Newcomer	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Written Opinion of the International Searching Authority for International Application No. PCT/US2012/024730 completed June 14, 2012.	☐

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Amazon Ex. 1002.0196

Receipt date: 08/09/2013	Application Number	13984744 - GAU: 2126
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	
	First Named Inventor	Paul Ryznar et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RYZ01 P-101A

	2	International Search Report and Written Opinion of the International Searching Authority for International Application No. PCT/US2006/39215, June 1, 2007.	☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature	/Anthony Whittington/	Date Considered	10/06/2015

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Amazon Ex. 1002.0197

Receipt date: 08/09/2013	Application Number	13984744 - GAU: 2126
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	
	First Named Inventor	Paul Ryznar et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RYZ01 P-101A

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Name/Print	Karl T. Ondersma	Registration Number	55894

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.W./

Notice of References Cited	Application/Control No. 13/984,744	Applicant(s)/Patent Under Reexamination RYZNAR ET AL.	
	Examiner ANTHONY WHITTINGTON	Art Unit 2126	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,341,183 A	08-1994	Dorsey-Palmateer, John W.	353/122
*	B	US-6,317,980 B1	11-2001	Buck, III, Carl Edward	29/897.31
*	C	US-2004/0111901 A1	06-2004	Newcomer, Ronald E.	033/286
*	D	US-2005/0154431 A1	07-2005	Quistgaard et al.	607/096
*	E	US-2006/0059699 A1	03-2006	Krantz et al.	033/286
*	F	US-2008/0121168 A1	05-2008	Ryznar et al.	116/201
*	G	US-7,433,796 B2	10-2008	Behan et al.	702/150
*	H	US-7,515,981 B2	04-2009	Ryznar et al.	700/95
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 10/26/2015

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER	
WHITTINGTON, ANTHONY T	

ART UNIT	PAPER NUMBER
2126	

NOTIFICATION DATE	DELIVERY MODE
10/26/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sytsma@glbf.com
patents@glbf.com
clark@glbf.com

Amazon Ex. 1002.0201

Office Action Summary	Application No. 13/984,744	Applicant(s) RYZNAR ET AL.	
	Examiner ANTHONY WHITTINGTON	Art Unit 2126	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8-9-13*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-23* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-23* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *8-9-13* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *8-9-13; 10-30-13;*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-23 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Ryznar et al. (U.S. Pub. No. 20080121168 A1; hereinafter, “Ryznar”).

Regarding claim 1, Ryznar discloses a method of projecting visual indicators onto a physical object to guide actions of an individual, said method comprising –interpreted as-An operational guide system (10) adapted to provide visual indicators to an individual t (abstract of Rynar, “An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26) is operable to detect operation information and generate an

output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller (20). “):

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of addressed display features –interpreted as- an operational guide system comprises a controller receiving at least a first input signal indicative of the operation information and at least one directional light device selectively operable to project and target at least one indicating light (para.0007 of Ryznar, “The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.”);

providing an input signal to said guide system controller –interpreted as- a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal (para.0007 of Ryznar, “The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.”);

selecting an addressed display feature based on said input signal-interpreted as- selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal (para.0007 of Ryznar, “The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller

receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.");

and projecting a visual indicator corresponding to said selected addressed display feature onto a physical object –interpreted as- project an indicating light at a location on parts bin (para.0025 of Ryznar, "Referring to FIGS. 1 and 2, when work piece 14 initially enters work station 16, the sensor apparatus 26 detects an operation information or characteristic or identification information associated with the work piece 14, such as, for example, the presence of and/or the type of work piece 14 present at the work station 16. In response to the detection by sensor apparatus 26, a first input signal 42 is communicated or transmitted to the control module 20 and, based on the detected or identified work piece 14 that the operator 12 is or will be working on, the control module 20 communicates or transmits a command signal 44 (FIG. 2) to directional light device 22 to project an indicating light 46 at a location on parts bin 34 to guide the operator 12 to a part required for a particular step in the assembly action.")

Regarding claim 15, Ryznar discloses a guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising comprising – interpreted as-An operational guide system (10) adapted to provide visual indicators to an individual t (abstract of Rynar, "An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor

apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26) is operable to detect operation information and generate an output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller (20). “):

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light–interpreted as- at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module (para.0007 of Ryznar, “The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.”);

a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers-interpreted as- ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, and provide notification to an operator of the presence of a work piece at the work station (para.0015 of Ryznar, “The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments

involving, for example, significant employee turnover and/or language and literacy barriers.");

said guide system controller receiving an input signal with said guide system controller causing said directional light device to project a visual indicator corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal. –interpreted as- detects an operation information or characteristic or identification information associated with the work piece and project an indicating light at a location on parts bin (para.0025 of Ryznar, "Referring to FIGS. 1 and 2, when work piece 14 initially enters work station 16, the sensor apparatus 26 detects an operation information or characteristic or identification information associated with the work piece 14, such as, for example, the presence of and/or the type of work piece 14 present at the work station 16. In response to the detection by sensor apparatus 26, a first input signal 42 is communicated or transmitted to the control module 20 and, based on the detected or identified work piece 14 that the operator 12 is or will be working on, the control module 20 communicates or transmits a command signal 44 (FIG. 2) to directional light device 22 to project an indicating light 46 at a location on parts bin 34 to guide the operator 12 to a part required for a particular step in the assembly action.")

Regarding claim 2, Ryznar discloses wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting a positional identifier based on said input signal, and wherein said projecting a visual indicator further comprises projecting a visual indicator corresponding to said selected

addressed display feature onto a physical object at a location corresponding to said selected positional identifier. –interpreted as- the ability of the assembly guide system to recognize the relative position of a part present at a work station and provide notification to an operator (para.0015 of Ryznar, “The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.”)

Regarding claims 3 and 16, Ryznar discloses wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signal is provided to said guide system controller from said manufacturing execution

system. –interpreted as- operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation and monitor cycle times of the individual operational steps and combined operations undertaken at the work station (para.0015 of Ryznar, “The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.”)

Regarding claim 4, Ryznar discloses wherein said manufacturing execution system receives a signal from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signal received by said

manufacturing execution system from said sensor apparatus.-interpreted as- assembly guide system is operable, in response to an operation information or characteristic or identification information associated with work piece detected by sensor apparatus (para.0024 of Ryznar, “Assembly guide system 10 is operable, in response to an operation information or characteristic or identification information associated with work piece 14 detected by sensor apparatus 26, to selectively provide indicating lights 46, 52 to guide an operator in the selection and/or assembly of parts to work piece 14, with the indicating lights 46, 52 being directed and/or provided based on, at least in part, the operation information detected by sensor apparatus 26. The system 10 is also or alternatively operable in response to one or more confirmation signals, such as confirmation signals 48, 56, and/or 84 of FIG. 2 that are described below, which may be manually or automatically supplied to control module 20 to verify completion of a particular operation or task. The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.”)

Regarding claims 5 and 17, Ryznar discloses wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signal is provided to said guide system controller from said system controller. –interpreted as- an operational guide system comprises a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the

first input signal (para.0007 of Ryznar, “The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.”)

Regarding claims 6 and 18, Ryznar discloses wherein said system controller receives signals from a sensor apparatus, and wherein said input signal is provided to said guide system controller based on said signals received by said system controller from said sensor apparatus. –interpreted as- an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information (para.0007 of Ryznar, “The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at

least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.")

Regarding claims 7 and 19, Ryznar discloses wherein said system controller comprises a programmable logic controller. –interpreted as- controller being programmable via at least one program screen displayable on a display device (para.0011 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The controller being programmable via at least one program screen displayable on a display device, the at least one program screen including at least one input field for entering and/or selecting indicia regarding sequential actions. The controller being further adapted to display at least one display screen on the display device during operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed.")

Regarding claims 8 and 20, Ryznar discloses wherein said system controller is interfaced with a manufacturing execution system. –interpreted as- operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation (para.0015 of Ryznar, "The operational guide system of the present

invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.")

Regarding claim 9, Ryznar discloses wherein said visual indicator comprises at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image. –interpreted as- information displayed includes a listing of sequential actions, animation and/or videos, part drawings (para.0012 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one display device, at least one

directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response to the first input signal with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The at least one display device being operable to display information regarding the sequential actions. The information displayed by the display device may include, for example, descriptive text regarding the sequential actions, a listing of sequential actions, animation and/or videos, part drawings. The display device may be configured as a touch screen to enable an operator to interact with the operational guide system via the touch screen.")

Regarding claim 10, Ryznar discloses providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on said visual indicator. –interpreted as- one confirmation signal indicative of a completion of an assembly action (para.0009 of Ryznar, "The controller may be adapted to receive at least one confirmation signal indicative of a completion of an assembly action, the at least one confirmation signal being either a manually input signal and an automated input signal. A manual input signal may be transmitted by an operator in response to completion of an assembly action by the operator selectively actuating a foot pedal and a push button. An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor.")

Regarding claim 11, Ryznar discloses providing a sensor apparatus, wherein said -sensor apparatus is operable to detect completion of the action and wherein said

sensor apparatus generates said confirmation signal. –interpreted as- at least one confirmation signal indicative of a completion of an assembly action and automated input signal may be transmitted by a confirmation sensor (para.0009 of Ryznar, “The controller may be adapted to receive at least one confirmation signal indicative of a completion of an assembly action, the at least one confirmation signal being either a manually input signal and an automated input signal. A manual input signal may be transmitted by an operator in response to completion of an assembly action by the operator selectively actuating a foot pedal and a push button. An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor.”)

Regarding claim 12 , Ryznar discloses wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator, and wherein said method comprises recording images while an operator is guided by said guide system.-interpreted as- use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece (para.0004 of Ryznar, “Several methods of preventing the improper assembly of a work piece exist. One such method is the use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece. Automated machine vision systems, however, are expensive and are highly customized such that they are only able to handle a limited assortment of work pieces. Other types of systems may involve human inspection of work piece products. Such

systems inherently involve human error such that a higher degree of nonconforming parts may go undetected. Furthermore, when human inspection systems are constructed as separate "inspection stations" apart from the value added work operations, manufacturing costs are increased by allowing nonconforming work pieces to leave work stations.")

Regarding claim 13, Ryznar discloses recording the time duration while an operator is guided by said guide system. -interpreted as- monitor cycle times of the individual operational steps and combined operations undertaken at the work station (para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training

individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.")

Regarding claim 14, Ryznar discloses displaying a recorded image and recorded time duration on a display device. –interpreted as- operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed (para.0011 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The controller being programmable via at least one program screen displayable on a display device, the at least one program screen including at least one input field for entering and/or selecting indicia regarding sequential actions. The controller being further adapted to display at least one display screen on the display device during operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed.")

Regarding claim 21, Ryznar discloses a camera operable to image at least one of actions of an individual guided by said visual indicator and said visual indicator.- interpreted as- use of cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece (para.0004 of Ryznar, "Several

methods of preventing the improper assembly of a work piece exist. One such method is the use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece. Automated machine vision systems, however, are expensive and are highly customized such that they are only able to handle a limited assortment of work pieces. Other types of systems may involve human inspection of work piece products. Such systems inherently involve human error such that a higher degree of nonconforming parts may go undetected. Furthermore, when human inspection systems are constructed as separate "inspection stations" apart from the value added work operations, manufacturing costs are increased by allowing nonconforming work pieces to leave work stations.")

Regarding claim 22, Ryznar discloses wherein said guide system controller records images and time durations while an operator is guided by said guide system. - interpreted as- provide and relay information to operator images of a work piece and monitor cycle times of the individual operational steps and combined operations undertaken at the work station (para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that

enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers."; para.0024 of Ryznar, "The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.")

Regarding claim 23, Ryznar discloses q monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor. -interpreted as- provide information to operator images of a work piece and monitor cycle times of the individual operational steps and combined operations undertaken at the work station (para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type,

and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers."; para.0024 of Ryznar, "The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.")

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY WHITTINGTON whose telephone number is (571)270-5314. The examiner can normally be reached on M-Th 8am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Fennema can be reached on (571)272-2748. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A.W.

/Robert Fennema/
Supervisory Patent Examiner, Art Unit 2126

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	Art Unit
	ANTHONY WHITTINGTON	2126

CPC- SEARCHED		
Symbol	Date	Examiner
G05B19/02	10-6-15	ATW

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
700	95	10-6-15	ATW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST	10-6-15	ATW

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/ANTHONY WHITTINGTON/ Examiner.Art Unit 2126	

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Confirmation No.	:	1049
Group Art Unit	:	2126
Examiner	:	Robert E. Fennema
Applicant	:	Paul Ryznar and James Ryznar
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For	:	**LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD**
Customer No.	:	15671

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

RESPONSE

Responsive to the Office Action mailed October 26, 2015, Applicant submits a petition for an extension of time to respond and wishes to amend the application as follows:

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 6 of this paper.

Remarks:

The amendments and remarks presented herein are believed to be fully responsive to the Office Action dated October 26, 2015. Claims 1-23 are pending in the application. Claims 1-6, 9, 10, 12, 15-18 and 21 have been amended as set forth above. The amendments are fully supported in the specification and drawings as originally filed. No new matter has been added.

CLAIM REJECTIONS:

Claims 1-23 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Pub. No. 20080121168 A1 to Ryznar et al. ("Ryznar"), which is the published application of U.S. Pat. No. 7,515,981 cited in the Information Disclosure Statement filed on August 9, 2013, which is commonly assigned to OPS Solutions LLC along with the present application. Applicant respectfully traverses the rejections because there are claim limitations that are not disclosed explicitly or inherently in Ryznar in the same manner as set forth in claims 1-23. However, in order to expedite prosecution, independent claims 1 and 15 have been amended as set forth above to further clarify Applicant's invention.

The method of claim 1 enables dynamic projecting of visual display features, such as onto a part for assembly or the selection of components for part kitting. Rather than discrete programs for each item to be worked on, as is the case with the cited Ryznar reference, dynamic selection of visual display features to be projected may be selected via selection of addressed display features that each have a separate address within the guide system controller. This dynamic selection and operation enables the method of claim 1 to flexibly project any sequence of visual display features, thereby readily and rapidly accomodating product changes without requiring the creation and/or editing of numerous programs.

Claim 1 as amended sets forth a method of projecting visual indicators onto a physical object to guide actions of an individual, with the method comprising the steps of providing a guide system having a guide system controller and a projector, with the guide system controller including a plurality of addressed display features, providing input signals to the guide system controller, and selecting addressed display features based on the input signals. The method further comprises projecting visual indicators corresponding to the selected addressed

display features onto the physical object, with the guide system controller configured to control operation of the projector to project the visual indicators. In addition, the input signals are specified as being transmitted from a separate system or controller to the guide system controller with each addressed display feature having a pre-programmed individual address within the guide system controller, and wherein the guide system controller is operative to dynamically project any sequence of visual indicators corresponding to respective addressed display features based on the input signals corresponding to desired visual indicators for the physical object.

In the method of projecting visual indicators as clarified by the amendment to claim 1, the guide system controller includes a plurality of addressed display features, with each addressed display feature having an individual address within the guide system controller. A separate system or a separate controller, such as a manufacturing exectuion system as set forth in claim 3 or a system controller as set forth in claim 5, provides input signals to the guide system controller. Specific addressed display features are then selected based on the input signals, with visual indicators corresponding to the addressed display features then being projected. The guide system controller is thereby operative to dynamically project any sequence of visual indicators corresponding to respective addressed display feature based on the input signals. Support for these amendments can be found, for example, in paragraphs [0074] to [0083] of the published international application WO 2012/109593 for the present application.

The approach of amended claim 1 is not disclosed or suggested by Ryznar, which is the Applicant's prior published application U.S. Pub. No. 20080121168. In contrast to the method of claim 1 of the present application, Ryznar discloses separate programs for each item to be worked on, where an "item" could be, for example, a part that is being assembled or inspected. Each such program directs a number of visual indicators to be projected specifically for that item, and at specific locations for that item. This requires numerous separate computer programs, with individually programed steps, for each individual item. This is problematic in situations in which operations are to be performed on a number of distinct items requiring numerous individual programs. This is also problematic in situations involving frequent changes to the desired projection of visual indicators, including in the case of product changes – such as a modification to a part or a different type of part selection was required.

A detailed description of the creation of programs in Ryznar is found starting at paragraph [0054] and continuing to paragraph [0062]. As there understood, a separate program for each part and sequence of operations to be performed is created, with the programming including the teaching of each specific display feature to be displayed in sequence and where the feature is to be projected. That is, a separate program for each individual "item", such as a part or the like, is created, with a particular sequence of visual indicators being established by the program. Ryznar thus does not disclose a plurality of addressed display features stored within a guide controller whereby the guide controller dynamically projects any sequence of visual indicators corresponding to input signals.

Claim 2 of the present method further specifies that the guide system controller additionally includes a plurality of positional identifiers, with the method further comprising selecting positional identifiers based on the input signals, and wherein projecting a visual indicator further comprises projecting a visual indicator corresponding to the selected addressed display feature onto a physical object at a location corresponding to the selected positional identifier.

Thus, according to the method of claim 2, an input signal dynamically causes the selection of an addressed display feature and a positional identifier, whereby the system projects a visual indicator corresponding to the addressed display feature at a location set by the positional identifier. In contrast, with the system of Ryznar, individual programs were required for each separate set of sequences of display features and locations.

Independent claim 15 specifies a guide system and has been amended to further clarify the system in similar manner to the clarifications discussed above in regard to claim 1. Claim 15 thus specifies a guide system comprising at least one directional light device that is selectively operable to project and target at least one indicating light, a guide system controller that includes a plurality of programmed addressed display features and a plurality of programmed positional identifiers, with each addressed display feature having a pre-programmed individual address within the guide system controller. The guide system controller receives input signals and causes the directional light device to project visual indicators corresponding to an addressed display feature onto a physical object at a location corresponding to a positional

identifier based on the input signals, wherein the guide system controller is operative to dynamically project any sequence of visual indicators corresponding to respective addressed display features based on the input signals corresponding to desired visual indicators for the physical object.

The system of amended claim 15 is not disclosed or suggested by Ryznar. In contrast to the system of claim 15 of the present application, Ryznar discloses a system having separate programs for each item to be worked on. Each such program directs a number of visual indicators to be projected specifically for that item, and at specific locations for that item. This requires numerous separate computer programs, with individually programed steps, for each individual item. Thys system of Ryznar neither discloses or suggests such a dynamic projection of visual indicators.

Claims 1-23 are pending in the application. Applicant respectfully submits that independent claims 1 and 15 are neither disclosed nor suggested by Ryznar such that they are in condition for allowance, along with claims 2-14 and 16-23 depending therefrom, and a notice to that effect is earnestly and respectfully requested.

The Examiner is invited to contact the undersigned at (616) 975-5500 should there be any questions or suggestions.

Respectfully submitted,

PAUL RYZNAR ET AL.

By: Gardner, Linn, Burkhart & Flory, LLP

Date: March 28, 2016

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the present application:

1. (currently amended) A method of projecting visual indicators onto a physical object to guide actions of an individual, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of addressed display features;

providing ~~an~~ input signals to said guide system controller;

selecting ~~an~~ addressed display features based on said input signals; and

projecting ~~a~~ visual indicators corresponding to said selected addressed display features onto ~~a~~ the physical object, with said guide system controller configured to control operation of said projector to project said visual indicators;

said input signals being transmitted from a separate system or controller to said guide system controller and each said addressed display feature having a pre-programmed individual address within said guide system controller, and wherein said guide system controller is operative to dynamically project any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the physical object.

2. (currently amended) The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting ~~a~~ positional identifiers based on said input signals, and wherein said projecting ~~a~~ visual indicators further comprises projecting ~~a~~ visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers.

3. (currently amended) The method of claim 1, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signals are ~~is~~ provided to said guide system controller from said manufacturing execution system.

4. (currently amended) The method of claim 3, wherein said manufacturing execution system receives ~~a~~ signals from a sensor apparatus, and wherein said input signals are ~~is~~ provided to said guide system controller based on said signals received by said manufacturing execution system from said sensor apparatus.

5. (currently amended) The method of claim 1, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signals are ~~is~~ provided to said guide system controller from said system controller.

6. (currently amended) The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are ~~is~~ provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. (original) The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. (original) The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. (currently amended) The method of claim 1, wherein said visual indicators comprise~~s~~ at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. (currently amended) The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on one or more of said visual indicators.

11. (original) The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor

apparatus generates said confirmation signal.

12. (currently amended) The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.

13. (original) The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. (original) The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. (currently amended) A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a pre-programmed individual address within said guide system controller;

said guide system controller receiving ~~an~~ input signals with said guide system controller causing said directional light device to project ~~a~~ visual indicators corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signals, wherein said guide system controller is operative to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the physical object.

16. (currently amended) The guide system of claim 15, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signals are ~~is~~ provided

to said guide system controller from said manufacturing execution system.

17. (currently amended) The guide system of claim 15, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signals are ~~is~~ provided to said guide system controller from said system controller.

18. (currently amended) The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are ~~is~~ provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

19. (original) The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. (original) The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. (currently amended) The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators.

22. (original) The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. (original) The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

Electronic Acknowledgement Receipt

EFS ID:	25320415
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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Warnings:					
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2	Extension of Time	02-ExtensionPetition.pdf	163920 f95c525096c4b26b3e65c56abc2988d68b449497	no	2
Warnings:					
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3	Amendment/Req. Reconsideration-After Non-Final Reject	03-RESPONSEA-RYZ01P101A.pdf	50545 2969a94ae52e2d205a72a6711e6fb198482510ca	no	9
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7	Non Patent Literature	NPL01-EuropeanSearchReport.pdf	233857 7558ea66302a41e5ec2851638f866ce17bf9d5eb	no	7
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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	13984744
Filing Date:	09-Aug-2013
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Filer:	Karl T. Ondersma/Leslie Vredeveld
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Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
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Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
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		Total in USD ($)		**390**

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/984,744	Filing Date 08/09/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **03/28/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 23	Minus	** 29	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/ERIC DANTZLER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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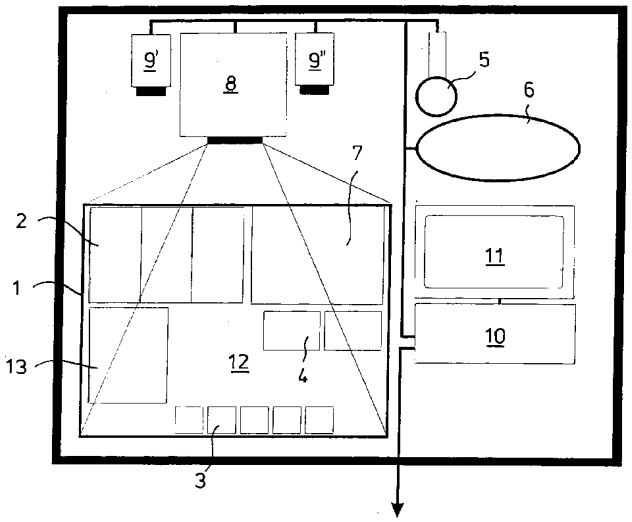
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Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

Prüfungsantrag gemäß § 44 PatG ist gestellt.

(54) Bezeichnung: **Verfahren und Vorrichtung zur Unterstützung der an einem Werkstattarbeitsplatz auszuführenden Tätigkeiten**

(57) Zusammenfassung: Verfahren und Vorrichtung zur Unterstützung der an einem Werkstattarbeitsplatz auszuführenden Tätigkeiten, wobei der Werkstattarbeitsplatz mindestens einen Arbeitstisch oder Werkstückträger, Werzeuge und/oder Bauteile umfasst. Hierzu wird der Arbeitsplatz so ausgebildet, dass oberhalb des Arbeitsplatzes eine Bilderzeugungseinrichtung angeordnet wird, die von einem Computer gesteuert starre Bilder der einzelnen Arbeitsfolgen darstellt. Gleichzeitig werden die dazu benötigten Werkzeuge und Bauteile beleuchtet. Mit einer zusätzlich oberhalb angeordneten Kamera kann der Arbeitsplatz weiter hinsichtlich Qualitätskontrolle benutzt werden. Das Verfahren und der Arbeitsplatz gestatten eine Vielzahl von Funktionen zur Erleichterung der Tätigkeiten, Erfassung der Betriebsdaten und Verbesserung der Qualität.



Beschreibung

[0001] Die vorliegende Erfindung betrifft ein Verfahren zur Unterstützung der an einem Werkstattarbeitsplatz auszuführenden Tätigkeiten, wobei der Werkstattarbeitsplatz mindestens eine Arbeitsfläche oder Werkstückträger, Werkzeuge und/oder Bauteile umfasst, sowie eine Vorrichtung zum Durchführen des Verfahrens.

Stand der Technik

[0002] Derartige Werkstattarbeitsplätze sind bekannt und allgemein üblich. Diese Werkstattarbeitsplätze weisen häufig als Arbeitsfläche einen Arbeitstisch oder eine sonstige zur Ablage von Bauteilen und Arbeitsmaterialien auf. An diesen Werkstattarbeitsplätzen werden Arbeiten, wie beispielsweise Prüfen, Montieren und auch Schulungen vorgenommen. Üblicherweise sind im Bereich der Arbeitsplätze griffbereit Werkzeuge und Kleinmaterialien, die beispielsweise in sogenannten Greifboxen untergebracht sind, vorhanden. Die Anweisungen für die Ausführenden werden der Arbeitsperson über Zeichnungen oder andere druckschriftliche Wiedergabemedien, die ebenfalls an dem Werkstattarbeitsplatz untergebracht werden können, mitgeteilt.

Aufgabenstellung

[0003] Der vorliegenden Erfindung liegt die Aufgabe zugrunde ein Verfahren und eine Vorrichtung vorzuschlagen, die die Möglichkeiten der Anweisung an die Arbeitsperson anders als bisher erlaubt und darüber hinaus zusätzliche Qualitätskontrollen, Datenerfassung und andere Anwendungserweiterungen ermöglicht.

[0004] Diese Aufgabe wird erfindungsgemäß durch ein Verfahren mit den Merkmalen des Verfahrensanspruchs sowie durch eine Vorrichtung mit den Merkmalen des Vorrichtungsanspruchs gelöst. Weitere vorteilhafte Ausgestaltungen sind den jeweiligen diesbezüglich rückbezogenen Unteransprüchen zu entnehmen.

[0005] Gemäß dem Verfahren werden die einzelnen Arbeitsschritte, die in einem Speicher abgelegt sind, von einer zentralen Steuereinheit ausgelesen und über eine Bilderzeugungseinrichtung auf der Arbeitsfläche oder in der Nähe der Arbeitsfläche abgebildet. Damit sieht die Arbeitsperson die einzelnen Arbeitsschritte als starre Bilder und kann entsprechend dem jeweiligen Arbeitsschritt die Montage oder Prüfung vornehmen. Das Verfahren ist auch geeignet, um als Lernprogramm zum Schulen von neuen Mitarbeitern angewendet zu werden. Die Abfolge der einzelnen Bilder wird von der Arbeitsperson selbst über geeignete Auslösemittel wie beispielsweise Tastaturen oder anderen Signalen (beispielsweise Geräusche) ausgelöst.

[0006] Gemäß einer weiterer Ausbildung des Verfahrens werden die für die Tätigkeit erforderlichen Werkzeuge und/oder Bauteile beleuchtet. Damit wird die Arbeitsweise weiter vereinfacht, da gleichzeitig mit der Abbildung des Arbeitsschrittes an einer ganz bestimmten Stelle auf der Arbeitsfläche oder in der Nähe der Arbeitsfläche die einzelnen dazu notwendigen Werkzeuge oder auch Greifboxen, in denen die anzubringenden Teile untergebracht sind, beleuchtet werden.

[0007] Gemäß einer anderen Ausbildung kann gemäß dem Verfahren die genaue Position des zu montierenden Teils an beispielsweise einem bereits vorhandenen größeren Teil angezeigt werden.

[0008] In einer weiteren Ausbildung des Verfahrens werden Organisationsdaten, wie beispielsweise Sollstückzahlen, Zeitvorgabe, Auftragsnummer usw. der Arbeitsperson als Display-Funktion zur Verfügung gestellt. Des Weiteren können vorteilhafterweise auch die Betriebsdaten (beispielsweise Bearbeiter, tatsächlich benötigte Zeit, Uhrzeit der Fertigung) durch Eingabe entsprechender Werte bzw. Eingabe der Startzeit erfasst werden.

[0009] In einer weiteren Ausbildung des Verfahrens werden die an oder auf der Arbeitsfläche angeordneten Bedienelemente durch die Steuereinheit je nach Bedarf mit der entsprechenden Funktion belegt und in der Funktion entsprechend gekennzeichnet. Dadurch ist es möglich, nur mit ganz wenigen Bedienelementen auszukommen, da bei einer Anordnung von einer Vielzahl von Bedienelementen selten alle bei einem Auftrag benötigt werden. Es ist daher möglich auftragsbezogen und auch entsprechend der einzelnen Arbeitsschritte die Bedienelemente unterschiedlich zu belegen, so dass dadurch nur ganz wenig Bedienelemente notwendig sind. Gleichzeitig kann das jeweilige zu betätigende Bedienelement, vergleichbar mit den Greifboxen oder den Werkzeugen angeleuchtet werden. Auch die Kennzeichnung seiner augenblicklichen Funktion kann damit erfolgen. So kann beispielsweise ein Taster der im einen Fall für das Ein- und Ausschalten einer Drucklufteinheit verwendet wird, im nächsten Fall für das Ein- und Ausschalten einer Messstation verwendet werden. Vorzugsweise können die einzelnen Tastelemente auch als ein Tastbildschirm ausgebildet sein, dessen Funktionen entsprechend belegt und gekennzeichnet sind.

[0010] Um das Verfahren hinsichtlich seiner Anwendbarkeit noch mehr zu erweitern, wird gemäß einer weiteren vorteilhaften Ausgestaltung mittels einer oberhalb der Arbeitsfläche angeordneten Bilderfassungseinrichtung zumindest die Arbeitsfläche mit allen für den Arbeitsvorgang benötigten Werkzeugen

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und/oder Bauteilen optisch erfasst und in der zentralen Steuereinheit ausgewertet. Dadurch kann beispielsweise eine Qualitätskontrolle durch Verfolgung der Bewegungen der Teile bzw. der Hände erfolgen. Wird beispielsweise ein Teil vergessen, so kann damit über die zentrale Steuereinheit ein Hinweis ausgegeben werden. Dieses Prinzip ermöglicht auch die Anwendung von virtuellen Tastern, wobei hierzu ggf. noch eine zweite Bilderfassungseinrichtung notwendig sein kann, die von der Seite die Handbewegungen zumindest in diesem Bereich erfasst.

[0011] Des Weiteren können die auszuübenden Tätigkeiten gemäß dem erfindungsgemäßen Verfahren in einem Videoclip abgebildet werden, wobei die Töne über eine zusätzliche Geräuschausgabe ausgegeben werden. Dies erleichtert zum Beispiel das Erlernen neuer Tätigkeiten. Als Erweiterung kann eine Live-Viedeokamera das aktuelle Bild an einen Trainerplatz zur Kontrolle senden. Als eine weitere Ausgestaltung kann ein im manuellen Arbeitsbereich befindliches automatisches System die Tätigkeit unterstützen. Dabei wird der aktuelle Sicherheitszustand, der ein Eingreifen der Arbeitsperson zu bestimmten Zeiten verbietet, durch eine entsprechende Beleuchtung, beispielsweise in einer bestimmten Farbe, visualisiert. Es wird dann das automatische System entsprechend angestrahlt.

[0012] Die erfindungsgemäße Vorrichtung zum Durchführen des Verfahrens weist eine Bilderzeugungseinrichtung auf, die mindestens ein Bild auf oder angrenzend an die Oberfläche des Arbeitstisches oder einer Projektionsfläche, auch in Rückprojektion (von unten), abbildet. Des Weiteren ist eine zentrale Steuereinheit, die mit der Bilderzeugungseinrichtung verbunden ist und über die Bildverarbeitungseinrichtung in einem Speicher abgelegte Bilder ausgibt, vorgesehen. An oder auf der Arbeitsfläche ist eine Tastatur zur Eingabe von Daten und/oder Ein-/Ausschaltvorgänge vorgesehen. Hierbei kann es sich einmal um eine numerische Tastatur und entsprechende zusätzliche Taster oder Einschalter für die Schaltvorgänge handeln. Bei der Vorrichtung projiziert die Bilderzeugungseinheit sowohl die einzelnen auszuführenden Arbeitsschritte für den Bediener sichtbar und auch die dazu erforderlichen Werkzeuge und/oder Bauteile.

[0013] Gemäß einer weiteren Ausbildung der Vorrichtung ist oberhalb der Arbeitsfläche eine Bilderfassungseinheit, beispielsweise eine Videokamera oder sonstige geeignete, dem Fachmann bekannte Einrichtung vorgesehen, die ebenfalls mit der zentralen Steuereinheit verbunden ist.

Ausführungsbeispiel

[0014] Nachfolgend wird die Erfindung anhand eines Ausführungsbeispiels in Verbindung mit den begleitenden Zeichnungen näher erläutert. Es stellen dar:

[0015] **Fig.** 1 ein schematisches Blockschaltbild für den Werkstattarbeitsplatz und

[0016] **Fig.** 2 eine perspektivische Ansicht eines anderen Werkstattarbeitsplatzes.

[0017] Das Blockschaltbild gemäß **Fig.** 1 zeigt schematisch die Oberseite beispielsweise eines Arbeitstisches **1** an dem zur Materialbereitstellung Greifboxen **2** zur Aufnahme von Kleinteilen und Werkzeug **3** angeordnet sind. Auf der rechten Seite des Arbeitstisches befindet sich eine Tastatur **4**, die eine Zifferntastatur sowie beispielsweise Taster für Schaltvorgänge umfassen kann. Des weiteren befindet sich ein Mikrofon **5**, ein Lautsprecher **6**, sowie eine Fläche **7** für die Abbildung von starren Bildern der Arbeitsfolge oder für ein Video im Bereich der Arbeitsfläche **13**. Oberhalb des Arbeitstisches **1** befindet sich die Bilderzeugungseinrichtung **8**, beispielsweise ein Beamer, sowie zwei Bilderfassungseinrichtung **9'**, **9"** in Form einer geeigneten Kamera. Beide sind mit einer zentralen Steuereinheit **10** verbunden. Der Steuereinheit **10** ist ein Speicher **11** zugeordnet. Die zentrale Steuereinheit **10** und der Speicher **11** können beispielsweise Teil eines üblichen Computers mit Tastatur und Monitor sein. Die zentrale Steuereinheit **10** ist außerdem über eine Leitung **12** mit einem Netzwerk verbindbar, beispielsweise um aktuelle Daten abfragen und einlesen zu können. In der Figur ist außerdem mit der Bezugsziffer **13** eine automatische Einrichtung angedeutet, in der einzelne Arbeitsschritte vollautomatisch durchgeführt werden.

[0018] Es kann sich dabei auch um einen Roboter handeln. Solange die Einrichtung **13** tätig ist, kann sie mit einer besonderen Farbe durch die Bilderzeugungseinrichtung beleuchtet werden, damit die Arbeitsperson dies erkennt. Ein Eingreifen in den Arbeitsbereich führt automatisch zu einen Anhalten der Einrichtung **13**.

[0019] Seitlich des Arbeitstisches **1** kann eine zusätzliche weitere Bilderfassungseinheit (nicht dargestellt) angeordnet sein, so dass dadurch die Taster **4** durch virtuelle Taster ersetzbar sind. Statt dessen ist es auch möglich, eine tastsensitive Fläche wie beispielsweise Tastbildschirm, zu verwenden.

[0020] **Fig.** 2 zeigt schematisch einen Arbeitsplatz mit einem Arbeitstisch **1** mit den im Halbkreis angeordneten Greifboxen **2** und einer oberhalb angeordneten Bilderzeugungseinrichtung **8**, hier in Form einer Umlenkeinrichtung. Auf und an diesem Tisch sind dann die in der **Fig.** 1 dargestellten Elemente entsprechend **Fig.** 2 anzuordnen.

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Patentansprüche

1. Verfahren zur Unterstützung der an einem Werkstattarbeitsplatz auszuführenden Tätigkeiten wobei der Werkstattarbeitsplatz mindestens eine Arbeitsfläche, Werkzeuge und/oder Bauteile umfasst, **dadurch gekennzeichnet**, dass einzelne Arbeitsschritte, die in einem Speicher (**11**) abgelegt sind, von einer zentralen Steuereinheit (**10**) ausgelesen und über eine Bilderzeugungseinrichtung (**8**) auf der Arbeitsfläche (**12**) oder in der Nähe der Arbeitsfläche abgebildet werden.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass die für die Tätigkeit erforderlichen Werkzeuge (**3**) und/oder Bauteile (**2**) beleuchtet werden.

3. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass die genaue Position eines zu montierenden Teils angezeigt wird.

4. Verfahren nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, dass Organisationsdaten angezeigt werden.

5. Verfahren nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, dass die Betriebsdaten erfasst werden.

6. Verfahren nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, dass an oder auf der Arbeitsfläche angeordnete Bedienelemente (**4**, **5**) durch die Steuereinheit (**10**) je nach Bedarf mit der entsprechenden Funktion belegt und der Funktion entsprechend gekennzeichnet werden.

7. Verfahren nach Anspruch 6, dadurch gekennzeichnet, dass als Bedienelemente ein Tastbildschirm verwendet wird, dessen Funktionen entsprechend belegt und gekennzeichnet werden.

8. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass mittels einer oberhalb der Arbeitsfläche (**12**) angeordneten Bilderfassungseinrichtung (**9**) die Arbeitsfläche mit allen für den Arbeitsvorgang benötigten Werkzeuge (**3**) und/oder Bauteile (**2**) optisch erfasst und in der zentralen Steuereinheit (**10**) ausgewertet werden.

9. Verfahren nach Anspruch 8 und 6, dadurch gekennzeichnet, dass die Bedienelemente (**5**) virtuell abgebildet werden und die Betätigung der Bedienelemente mittels einer zweiten Bilderfassungseinrichtung festgestellt wird.

10. Verfahren nach Anspruch 8 und 6, dadurch gekennzeichnet, dass die Bedienelemente (**5**) virtuell abgebildet werden und die Betätigung der Bedienelemente mittels einer tastsensitiven Fläche festgestellt wird.

11. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass für das Anlernen der auszuübenden Tätigkeit ein Videoclip abgebildet und der Ton über eine zusätzliche Geräuschausgabe (**6**) ausgegeben wird.

12. Werkstattarbeitsplatz mit einer Arbeitsfläche, Werkzeugen und/oder Bauteilen zur Durchführung des Verfahrens nach einem der Ansprüche 1–7, gekennzeichnet durch
eine Bilderzeugungseinrichtung (**8**) zur Projektion eines Abbildes auf eine Projektionsfläche mittels der mindestens ein Bild auf- oder angrenzend an die Arbeitsfläche (**12**) abbildbar ist;
eine zentrale Steuereinheit (**10**), die mit der Bilderzeugungseinrichtung (**8**) verbunden ist und über die Bilderzeugungseinrichtung (**8**) in einem Speicher abgelegte Bilder ausgibt;
einen Arbeitstisch mit einer Tastatur (**4**) zur Eingabe von Daten und/oder Ein-/Ausschaltvorgängen;
wobei die Bilderzeugungseinrichtung (**8**) sowohl die einzelnen auszuführenden Arbeitsschritte für den Bediener sichtbar projiziert als auch die dazu erforderlichen Werkzeuge (**3**) und/oder Bauteile (**2**) beleuchtet.

13. Werkstattarbeitsplatz nach Anspruch 11, dadurch gekennzeichnet, dass oberhalb der Arbeitsfläche (**12**) eine Bilderfassungseinrichtung (**9**) angeordnet ist, die ebenfalls mit der zentralen Steuereinheit (**10**) verbunden ist.

Es folgen 2 Blatt Zeichnungen

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Anhängende Zeichnungen

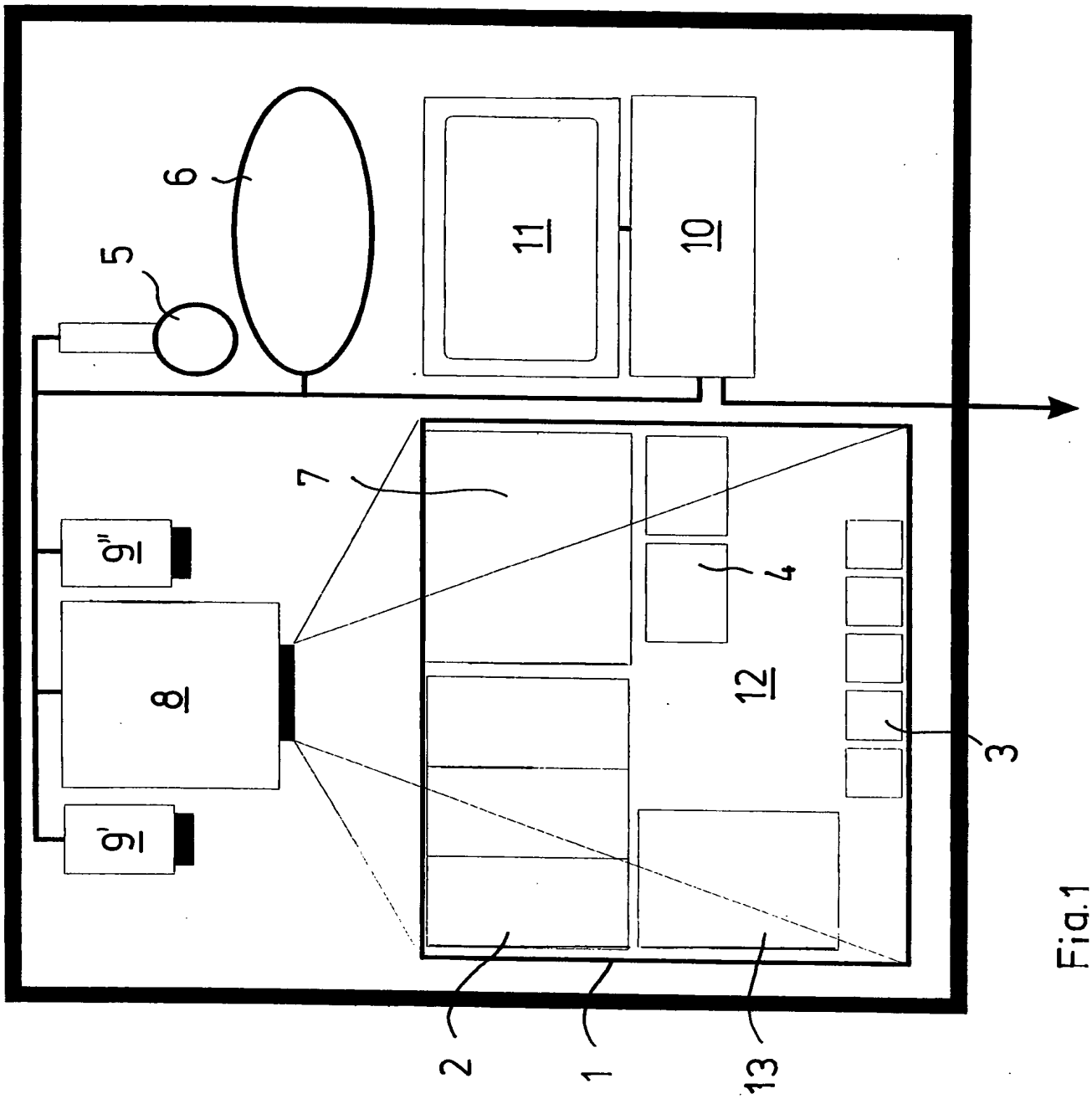


Fig.1

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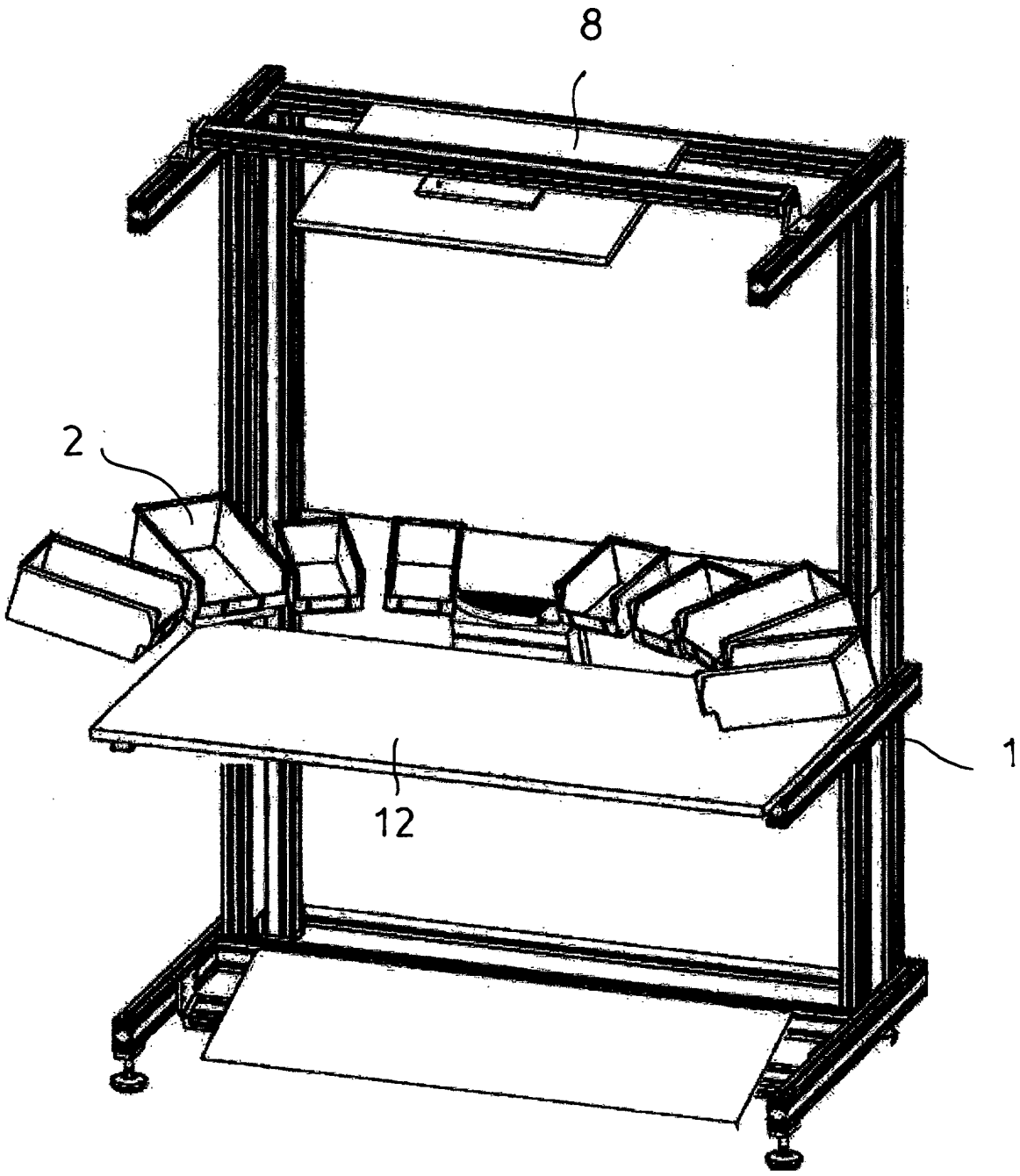


Fig. 2

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Espacenet

Bibliographic data: DE10320557 (A1) — 2004-12-09

Workstation for carrying out manufacturing or other work processes has a projection unit with a memory and a control unit for output of operating, training and reference information to the work surface so that it can be viewed

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Classification: - international: ***B23P21/00; B23Q17/24; H05K13/00;*** (IPC1-7): B25H1/02
- cooperative: **B23P21/00**; **B23Q17/2404**; **H05K13/0053**

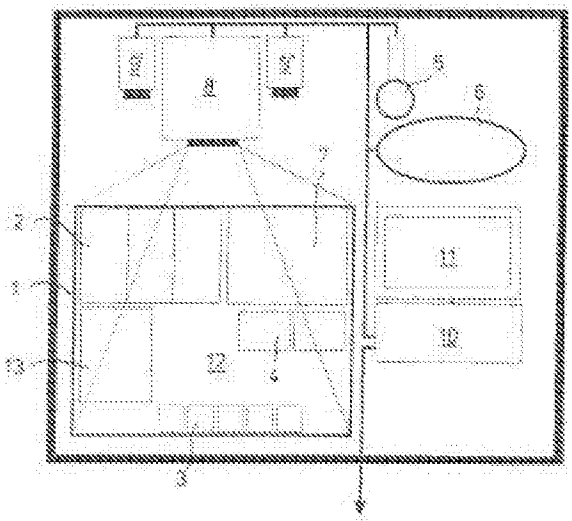
Application number: DE2003120557 20030507

Priority number (s): DE2003120557 20030507

Also published as: DE10320557 (B4)

Abstract of DE10320557 (A1)

Method for supporting the activities to be carried out at a workstation that comprises a work surface, tools and or other components. According to the method individual work steps that are stored in a memory (11) are read out from a central control unit (10) and projected using an image generating unit (8) on the work surface (12) and or its adjoining surfaces. The invention also relates to a corresponding workstation.



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DESCRIPTION DE10320557

The present invention relates to a method for Unterstützungder at a workshop workplace activities to be performed, the workshop workplace least a work surface or workpiece carriers, tools and / or Bauteileumfasst, and an apparatus for performing the method.

Such workshop workplaces are known and common practice.

This workshop workplaces frequently have as a work surface a work table or in another for storing components and materials.

At this workshop workplaces work, such as checking, installing are made andalso training.

Typically, in the area of jobs to hand tools and small materials that are housed in so-called example gripping boxes available.

The instructions for the performers are working person on drawings or other pressure-written reproduction media, which can also be accommodated at demWerkstattarbeitsplatz informed.

The present invention has for its object a Verfahrenund propose a device which to work Person Unlike allowed the possibilities of the statement date and will provide additional quality controls, Datenerfassungund allows other application extensions.

This object is inventively achieved by a method having the characteristic end method claim and by a device with the features of apparatus claim resolved.

Further advantageous embodiments are given in appended dependent claims in this regard the relevant.

According to the method the individual working steps which are stored in a memory, read out by a central control unit and an image forming means on the work surface or in the vicinity of the Arbeitsflächeabgebildet.

Thus the worker sees the individual steps as rigid images and can according to the respective step, the assembly or test making.

The method is also suitable to be used as a learning program for schools vonneuen employees.

The sequence of the individual images is Vonder working person himself through suitable triggering means such as keyboard or other signals triggered (eg noise).

According to a further embodiment of the process required for dieTätigkeit tools and / or components are illuminated.

Thus dieArbeitsweise is further simplified since the same time, be illuminated with the image of Arbeitsschrittesan a particular point on the work surface or near the Arbeitsflächedie individual necessary molds or gripping boxes in which the mounted parts are housed.

According to another embodiment, the exact position of the part to be mounted on can be displayed, for example, an existing large part according to the method.

In a further embodiment of the method organizational data, such as target quantities, timing, order number, etc. of the working staff display function are provided.

Furthermore, advantageously, the operating data (eg processor, actually required time Uhrzeitder production) by entering corresponding values or

Be detected entering the starting time.

In a further embodiment of the method which are arranged on or aufder workspace controls to be used by the control unit depending on Bedarfmit the corresponding function and are marked accordingly in the function.

This makes it possible to make do with very few controls because beieiner arrangement of a plurality of control elements are rarely all at a Auftragbenötigt.

Therefore, it is possible to order and also according dereinzelnen steps to validate the controls differently, so that this very little controls are necessary.

At the same time, the jeweiligezu operable control element, are similar to the gripping boxes or tools illuminated.

Also marking its instantaneous function can thus be carried out.

For example, a button that is used in a case for the switching on and off of a compressed air unit can be used in the next case for dasEin- and off a station.

Preferably dieeinzelnen sensing elements can also be designed as a touch screen, whose function According occupied and marked.

To extend the process in terms of its applicability even more, according to a further advantageous embodiment, by means of an above derArbeitsfläche arranged image capture device at least the Arbeitsflächemit all Werkzeugenund / or components required for the operation optically detected and evaluated in the central control unit.

This can for example be a quality control by tracking the movements of the hands or changed parts.

For example, if a part forgotten, can thus on the central control unit a notice will be issued.

This principle made light without limitation of virtual buttons, for which purpose, if necessary, may be a second image capture device necessary nor that. From the side, the hand movements, at least in this region Captures

Furthermore, the activities to be exercised in accordance with the method according to the invention can be displayed in a video clip, in which the tones are output via an additional sound output.

This facilitates, for example, new learning activities.

As an extension, a live Viedeokamera send the current picture to a coach's seat to control.

As a further refinement can support the activities of a work in manually workspace automatic system.

In this case, the current security state, which prohibits to determine intervention times the worker, by selecting the appropriate lighting, for example in a particular color, visualized.

It is accordingly illuminated then the automated system.

The inventive device on for performing the method, an image forming apparatus which reproduces at least one picture on the surface or angrenzendan the worktable or a projection, even in rear projection (from the bottom).

Furthermore, a central control unit, which is connected to derBilderzeugungseinrichtung and outputs via the Bildverarbeitungseinrichtungin a memory stored images, are provided.

Provided at or on the Arbeitsflächeist a keyboard for inputting data and / or switch on / off.

This may even be a numeric keypad and appropriate additional switch or power switch for switching operations.

In the apparatus projiziertdie imaging unit both the individual steps executed forthe operator visible and also the necessary tools and / or components.

According to a further embodiment of the device, for example a video camera or other suitable means known in the art is above the working surface of an imaging unit, is provided which is also connected to the central control unit is connected.

The invention by way of example inVerbindung with the accompanying drawings will be explained in more detail.

It represent:

1An schematic block diagram forthe workshop workplace and

2 shows a perspective view of a different workshop workplace.

The block diagram gemäß1zeigt schematischdie top example of the Arbeitstisches1an to MaterialbereitstellungGreifboxen2zur recording small parts and Werkzeug3angeordnetsind.

On the right side of the worktable is a Tastatur4 which can be a numeric keypad as well as buttons for switching operations for Embrace.

Furthermore, there is a Mikrofon5, a Lautsprecher6, and a Fläche7für the mapping of rigid images derArbeitsfolge or a video in the Arbeitsfläche13.

Oberhalbdes Arbeitstisches1befindet the Bilderzeugungseinrichtung8, for example, a projector, and two Bilderfassungseinrichtung9 ', 9"in form a suitable camera.

Both are equipped with a central Steuereinheit10verbunden.

The Steuereinheit10istein Speicher11zugeordnet.

The central Steuereinheit10undder Speicher11können example, be part of a standard computer monitor and mitTastatur.

To a network connectable, query the central Steuereinheit10ist also has a Leitung12mit example, current data and read.

In the figure is also equipped with the automatic device Bezugsziffer13eine indicated, are carried out in the individual work steps automatically.

They may be also be a robot.

As long as the Einrichtung13tätig is, it can be through the imaging device illuminates with a special color, so that the working person recognizes this.

An intervention in the workspace automatically lead to a stoppage of Einrichtung13.

Laterally of Arbeitstisches1kann an additional further imaging unit (not shown) may be arranged so that by the Taster4durch virtual buttons are replaceable.

Instead, it is also possible to use a touch-sensitive surface such as touch screen.

2shows schematically a Arbeitsplatzmit a Arbeitstisch1mit the arranged in a semicircle above a Greifboxen2und arranged Bilderzeugungseinrichtung8, here in the form of a deflection.

On and around this table in the der1dargestellten elements are then entsprechend2anzuordnen.

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CLAIMS DE10320557

A method of supporting auszuführendenTätigkeiten at a workshop workplace where the workshop workplace at least a work surface, Werkzeugeund / or components includes, characterized in that individual work steps (11) are stored in a memory of a central control unit (10) is read out and an image forming apparatus (8) are mapped aufder working surface (12) or in the vicinity of the working surface.

A method according to claim 1, characterized in that the necessary dieTätigkeit tools (3) and / or components (2) are illuminated.

The method of claim 1 or 2, characterized in that diegenaue position of a part to be mounted is displayed.

Method according to one of the preceding claims, characterized in that organization information is displayed.

Method according to one of the preceding claims, characterized in that the operating data are detected.

Method according to one of the preceding claims, characterized in that at or on the working surface control elements (4,5) by the control unit (10) according to need is assigned the function corresponding to the function and are marked accordingly.

A method according to claim 6, characterized in that touch screen is used as Bedienelementeein whose functions are assigned and marked accordingly.

A method according to claim 1, characterized in that arranged by means of a top of the working surface (12) image capturing means (9) evaluates the work surface with all required for the operation tools (3) and / or components (2) is optically detected and in the central control unit (10) become.

The method of claim 8 and 6, characterized in that the control elements (5) are represented virtually and operation of the controls is determined means a second image capture device.

The method of claim 8 and 6, characterized in that thieves operating elements (5) are represented virtually and operation of the controls by means of a touch-sensitive surface is detected.

The method of claim 1, characterized in that displayed a video clip for the Anlernender exercised activities and the sound from an additional sound output (6) is issued.

Workshop workstation with a work surface, tools and / or devices for performing the method according to one of claims 1-7, characterized by an imaging device (8) for projecting an image onto a projection surface by means of at least up an image or adjacent to the working surface (12) is imaged; a central control unit (10) which is connected to the image generating means (8) and is output from the imaging means (8) ina memory stored images; a work table with a keyboard (4) for inputting data and / oderEin- / off operations; said image forming means (8) both the individual auszuführendenArbeitsschritte for the operator as well as the visible projected to necessary tools (3) and / or components (2) illuminates.

Workshop workstation according to claim 11, characterized in that above the working surface (12) an image capture device (9) is arranged, which verbundenist also connected to the central control unit (10).

Here the 2 leaf drawings

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(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	Robert E. Fennema
Attorney Docket Number	RYZ01 P-101A

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Art Unit	2127
Examiner Name	Robert E. Fennema
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First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	Robert E. Fennema
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Application Number	13/984,744
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First Named Inventor	Paul Ryznar et al.
Art Unit	2126
Examiner Name	Robert E. Fennema
Attorney Docket Number	RYZ01 P-101A

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- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Gardner, Linn, Burkhart & Flory, LLP		
Signature	/Karl T. Ondersma/		
Printed name	Karl T. Ondersma		
Date	March 28, 2016	Reg. No.	55894

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	/Leslie R. Vredeveld/		
Typed or printed name	Leslie R. Vredeveld	Date	March 28, 2016

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	20	("4469553" | "20060106483" | "20070180674" | "5341183" | "6317980" | "7193696" | "7433796" | "7463368" | "20040111901" | "20060059699" | "20060185181" | "2682117" | "3600785" | "3623066" | "3667104" | "3986244" | "4102568" | "4163309" | "4222036" | "7515981").PN.	US-PGPUB; USPAT	OR	ON	2016/04/25 12:38
L2	1	("20080121168").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/04/25 12:40
L3	3	(("RYZNAR") near3 ("Paul")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/04/25 12:41
L4	3	(("RYZNAR") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/04/25 12:41
L5	1	("2013/0325155").URPN.	USPAT	OR	ON	2016/04/25 12:41
L6	4	(ops adj2 solutions).as.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
L7	4	4 5	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
L8	3	2 4	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
L9	3	3 4	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
L10	4814	(G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001).cpc.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:57
L11	1106	700/95.ccls.	US-	OR	ON	2016/04/25

			PGPUB; USPAT; FPRS; EPO			13:57
L12	56653	(guide adj2 (system control controller))	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L13	72690	(project projector) adj5 (object work piece device)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L14	5833	10 11	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L15	572	12 and 13	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L16	47	12 and 14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L17	52	13 and 14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L18	96	16 17	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
L19	464998	(guide visual indicator light projection) near4 (operator user)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
L20	47163	guide adj3 system	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
L21	127	12 and 13 and 19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
L22	12930	(guide adj3 system).ab.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
L23	190143	(pick place picking placing placement) adj4	US-	OR	ON	2016/04/25

		(part component bin)	PGPUB; USPAT; FPRS; EPO			14:03
L24	12	22 and 14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
L25	12988	19 and 23	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
L26	617	25 and 700/$.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:04
L27	48	26 and 14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:04

EAST Search History (Interference)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 04/28/2016

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EXAMINER
EVERETT, CHRISTOPHER E

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
04/28/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sytsma@glbf.com
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Office Action Summary	Application No. 13/984,744	Applicant(s) RYZNAR ET AL.	
	Examiner Christopher E. Everett	Art Unit 2121	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/28/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-23* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-23* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *3/28/2016*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. The Office Action is responsive to the communication filed on 3/28/2016.

3. Claims 1-23 are pending.

Response to Arguments

4. Applicant's arguments filed 3/28/2016 have been fully considered but they are not persuasive.

Regarding claims 1-23, the applicant argues that Ryznar does not teach or suggest the claim limitations as described below. The Examiner respectfully disagrees. Ryznar describes the claim limitations as briefly outlined below with respect to independent claim 1 and as described in the rejection of independent claims 1 and 15 below. Independent claim 15 includes similar claim limitations as outlined below with respect to independent claim 1. Claims 2-14 and 16-23 depend, directly or indirectly, from independent claims 1 and 15.

- "said input signals being transmitted from a separate system or controller to said guide system controller and" (see, e.g., Ryznar: see the sensor apparatus 26 and confirmation module 28 and parts bin 34 that are separate from the control module 20 as illustrated in figure 2; "An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor." Paragraph 0009)

- "each said addressed display feature having a pre-programmed individual address within said guide system controller, and" (see, e.g., Ryznar: see each command signal 44a, 44b, 44c, 50a, 50b, 50c that correspond to the lights 46a, 46b, 46c, 52a, 52b, 52c (i.e., pre-programmed individual addresses) as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that **indicating light 52a is projected on operational step location 54a** on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053 (emphasis added))
- "wherein said guide system controller is operative to dynamically project any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the physical object." (see, e.g., Ryznar: see the changing of the sequence of indicating lights (i.e., dynamically project any sequence of visual indicators) based on the input signals that a proper part was selected as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then **terminates projection of indicating light 46a** and transmits command signal 50a to directional light device 24 such that **indicating light 52a is projected on operational step location 54a** on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053 (emphasis added))

Accordingly, applicant's arguments are not persuasive since Ryznar describes the limitations in claims 1-23.

Regarding claim 2, the applicant argues that Ryznar does not teach or suggest the claim limitations as described below. The Examiner respectfully disagrees. Ryznar describes the claim limitations as briefly outlined below with respect to claim 2 and as described in the rejection of claim 2 below.

- "said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further comprises projecting visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers." (see, e.g., Ryznar: see each command signal 44a, 44b, 44c, 50a, 50b, 50c that correspond to the lights 46a, 46b, 46c, 52a, 52b, 52c based on the needed parts and their positions (i.e., positional identifiers) as illustrated in figure 2 and as described in paragraph 0053; "Control module 20 is illustrated as transmitting command signal 44a to directional light device 22, which in response to command signal 44a, projects indicating light 46a on **storage location 70a of parts bin 34**. Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on **operational step**

location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053 (emphasis added))

Accordingly, applicant's arguments are not persuasive since Ryznar describes the limitations in claim 2.

For at least these reasons, the rejection of the claims is maintained.

Claim Objections

5. Claim 1 is objected to because of the following informalities: "selecting addressed display features" is ambiguous as to the metes and bounds of the terminology. In particular, are the addressed display features being selected the same or different from the plurality of addressed display features included in the guide system controller? Applicant is advised that the terminology should be clarified to remove the ambiguity (e.g., selecting a first set of addressed display features from the plurality of addressed display features"). Appropriate correction is required.

6. Claim 1 is objected to because of the following informalities: The limitation "said addressed display feature" is recited. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the limitation is assumed to be "each of the plurality of addressed display features." Appropriate correction is required.

7. Claim 15 is objected to because of the following informalities: The limitation "said addressed display feature" is recited. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the limitation is assumed to be "each of the plurality of programmed addressed display features." Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-23 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Ryznar et al. (U.S. Pub. No. 20080121168 A1; hereinafter, "Ryznar").

Regarding **claim 1**, Ryznar discloses a method of projecting visual indicators onto a physical object to guide actions of an individual, said method comprising *–interpreted as-An operational guide system (10) adapted to provide visual indicators to an individual t* **(abstract of Rynar, "An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26)**

is operable to detect operation information and generate an output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller (20). "):

- providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of addressed display features *–interpreted as- an operational guide system comprises a controller receiving at least a first input signal indicative of the operation information and at least one directional light device selectively operable to project and target at least one indicating light* **(para.0007 of Ryznar, "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.");**

- providing input signals to said guide system controller –*interpreted as- a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal* **(Ryznar: see the input signals 48a, 48b, 48c, 56, 42 to the control module 20 as illustrated in figures 1, 2 and as described in paragraph 0025; "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module." Paragraph 0007; "A cycle time measurement may, for example, be initiated upon receipt of a first input signal 42 from sensor apparatus 26, and completed upon detection of a confirmation signal 48, 56, 84." Paragraph 0063);**
- selecting addressed display features based on said input signals-*interpreted as- selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal* **(Ryznar: see**

the lights 22, 24 projecting on the designed work piece 14 and/or parts bin 34 locations as illustrated in figures 1, 2 and as described in paragraph 0032; "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module." Paragraph 0007; "Directional light device 22 is used to project indicating lights 46 at the component location 32, while the other directional light device 24 is used to project indicating lights 52 at operational step locations 54 on work piece 14. Each directional light device 22, 24 includes a light source 66 for projecting indicating lights 46, 52, with the directional light devices 22, 24 constructed such that the indicating lights 46, 52 may be selectively and movably positionable to direct the indicating light 46, 52 at pre-targeted locations." Paragraph 0032); and

- projecting visual indicators corresponding to said selected addressed display features onto the physical object, with said guide system controller configured to control operation of said projector to project said visual indicators; *–interpreted as- project an*

indicating light at a location on parts bin **(Ryznar: see the control module 20 (i.e., guide system controller) controlling the operation of the directional light devices 22, 24 (i.e., projector) to project light 46a, 46b, 46c (i.e., visual indicators) onto a parts bin 34 (i.e., physical object) as illustrated in figure 2; para.0025 of Ryznar, "Referring to FIGS. 1 and 2, when work piece 14 initially enters work station 16, the sensor apparatus 26 detects an operation information or characteristic or identification information associated with the work piece 14, such as, for example, the presence of and/or the type of work piece 14 present at the work station 16. In response to the detection by sensor apparatus 26, a first input signal 42 is communicated or transmitted to the control module 20 and, based on the detected or identified work piece 14 that the operator 12 is or will be working on, the control module 20 communicates or transmits a command signal 44 (FIG. 2) to directional light device 22 to project an indicating light 46 at a location on parts bin 34 to guide the operator 12 to a part required for a particular step in the assembly action.")**

- said input signals being transmitted from a separate system or controller to said guide system controller and **(Ryznar: see the sensor apparatus 26 and confirmation module 28 and parts bin 34 that are separate from the control module 20 as illustrated in figure 2; "An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor." Paragraph 0009)**
- each said addressed display feature having a pre-programmed individual address within said guide system controller, and **(Ryznar: see each command signal 44a, 44b, 44c, 50a, 50b, 50c that correspond to the lights 46a, 46b, 46c, 52a, 52b, 52c (i.e., pre-**

programmed individual addresses) as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053)

- wherein said guide system controller is operative to dynamically project any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the physical object. **(Ryznar: see the changing of the sequence of indicating lights (i.e., dynamically project any sequence of visual indicators) based on the input signals that a proper part was selected as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053)**

Regarding **claim 15**, Ryznar discloses a guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising comprising *–interpreted as-An*

operational guide system (10) adapted to provide visual indicators to an individual t **(abstract of Rynar, "An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26) is operable to detect operation information and generate an output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller (20). "):**

- at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light–*interpreted as- at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module* **(para.0007 of Ryznar, "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively**

operable to project and target at least one indicating light in response to the at least one command signal from the control module.");

- a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a pre-programmed individual address within said guide system controller; *-interpreted as- ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, and provide notification to an operator of the presence of a work piece at the work station* **(Ryznar: "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational**

step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers." Paragraph 0015; see each command signal 44a, 44b, 44c, 50a, 50b, 50c that correspond to the lights 46a, 46b, 46c, 52a, 52b, 52c (i.e., pre-programmed individual addresses) as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053)

- said guide system controller receiving input signals with said guide system controller causing said directional light device to project visual indicators corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signal, *–interpreted as- detects an operation information or characteristic or identification information associated with the work piece and project an indicating light at a location on parts bin* **(para.0025 of Ryznar, "Referring to FIGS. 1 and 2, when work piece 14 initially enters work station 16, the sensor apparatus 26 detects an operation information or characteristic or identification information associated with the work piece 14, such as, for example, the presence of and/or the type of work piece 14 present at the work station 16. In**

response to the detection by sensor apparatus 26, a first input signal 42 is communicated or transmitted to the control module 20 and, based on the detected or identified work piece 14 that the operator 12 is or will be working on, the control module 20 communicates or transmits a command signal 44 (FIG. 2) to directional light device 22 to project an indicating light 46 at a location on parts bin 34 to guide the operator 12 to a part required for a particular step in the assembly action.")

- wherein said guide system controller is operative to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the physical object. **(Ryznar: see the changing of the sequence of indicating lights (i.e., dynamically project any sequence of visual indicators) based on the input signals that a proper part was selected as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053)**

Regarding **claim 2**, Ryznar discloses wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further

comprises projecting visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers. – *interpreted as- the ability of the assembly guide system to recognize the relative position of a part present at a work station and provide notification to an operator* **(Ryznar: see each command signal 44a, 44b, 44c, 50a, 50b, 50c that correspond to the lights 46a, 46b, 46c, 52a, 52b, 52c based on the needed parts and their positions (i.e., positional identifiers) as illustrated in figure 2 and as described in paragraph 0053; "Control module 20 is illustrated as transmitting command signal 44a to directional light device 22, which in response to command signal 44a, projects indicating light 46a on storage location 70a of parts bin 34. Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053; "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a**

work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers." Paragraph 0015)

Regarding **claims 3 and 16**, Ryznar discloses wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system. *–interpreted as- operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation and monitor cycle times of the individual operational steps and combined operations undertaken at the work station* **(Ryznar: see the sensor apparatus 26 and confirmation module 28 and parts bin 34 that are separate from the control module 20 as illustrated in figure 2; "An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor." Paragraph 0009; "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type,**

and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers." Paragraph 0015)

Regarding **claim 4**, Ryznar discloses wherein said manufacturing execution system receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said manufacturing execution system from said sensor apparatus.-*interpreted as- assembly guide system is operable, in response to an operation information or characteristic or identification information associated with work piece detected by sensor apparatus* **(Ryznar: see the input signals 48a, 48b, 48c, 56, 42 to the control module 20 as illustrated in figures 1, 2 and as described in paragraph 0025; "Assembly guide system 10 is operable, in response to an operation information or characteristic or identification information associated with work piece 14 detected by sensor apparatus 26, to selectively provide indicating lights 46, 52 to guide an operator in the selection and/or assembly of parts to work piece 14, with the indicating lights 46, 52 being directed and/or**

provided based on, at least in part, the operation information detected by sensor apparatus 26. The system 10 is also or alternatively operable in response to one or more confirmation signals, such as confirmation signals 48, 56, and/or 84 of FIG. 2 that are described below, which may be manually or automatically supplied to control module 20 to verify completion of a particular operation or task. The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step." para. 0024)

Regarding **claims 5 and 17**, Ryznar discloses wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signals are provided to said guide system controller from said system controller. *–interpreted as- an operational guide system comprises a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal* **(Ryznar: see the input signals 48a, 48b, 48c, 56, 42 to the control module 20 as illustrated in figures 1, 2 and as described in paragraph 0025; para.0007 of Ryznar, "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation**

information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.")

Regarding **claims 6 and 18**, Ryznar discloses wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus. – *interpreted as- an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information* **(Ryznar: see the input signals 48a, 48b, 48c, 56, 42 to the control module 20 as illustrated in figures 1, 2 and as described in paragraph 0025; para.0007 of Ryznar, "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.")**

Regarding **claims 7 and 19**, Ryznar discloses wherein said system controller comprises a programmable logic controller. *–interpreted as- controller being programmable via at least one program screen displayable on a display device* **(para.0011 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The controller being programmable via at least one program screen displayable on a display device, the at least one program screen including at least one input field for entering and/or selecting indicia regarding sequential actions. The controller being further adapted to display at least one display screen on the display device during operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed.")**

Regarding **claims 8 and 20**, Ryznar discloses wherein said system controller is interfaced with a manufacturing execution system. *–interpreted as- operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly,**

packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.")

Regarding **claim 9**, Ryznar discloses wherein said visual indicators comprise at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image. *–interpreted as- information displayed includes a listing of sequential actions, animation and/or videos, part drawings* **(para.0012 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one display device, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response to the first input signal with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the**

controller. The at least one display device being operable to display information regarding the sequential actions. The information displayed by the display device may include, for example, descriptive text regarding the sequential actions, a listing of sequential actions, animation and/or videos, part drawings. The display device may be configured as a touch screen to enable an operator to interact with the operational guide system via the touch screen.")

Regarding **claim 10**, Ryznar discloses providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on one or more of said visual indicators. *–interpreted as- one confirmation signal indicative of a completion of an assembly action* **(para.0009 of Ryznar, "The controller may be adapted to receive at least one confirmation signal indicative of a completion of an assembly action, the at least one confirmation signal being either a manually input signal and an automated input signal. A manual input signal may be transmitted by an operator in response to completion of an assembly action by the operator selectively actuating a foot pedal and a push button. An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor.")**

Regarding **claim 11**, Ryznar discloses providing a sensor apparatus, wherein said -sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal. *–interpreted as- at least one confirmation signal indicative of a completion of an assembly action and automated input signal may be transmitted by a*

confirmation sensor **(para.0009 of Ryznar, "The controller may be adapted to receive at least one confirmation signal indicative of a completion of an assembly action, the at least one confirmation signal being either a manually input signal and an automated input signal. A manual input signal may be transmitted by an operator in response to completion of an assembly action by the operator selectively actuating a foot pedal and a push button. An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor.")**

Regarding **claim 12**, Ryznar discloses wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.*-interpreted as- use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece* **(para.0004 of Ryznar, "Several methods of preventing the improper assembly of a work piece exist. One such method is the use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece. Automated machine vision systems, however, are expensive and are highly customized such that they are only able to handle a limited assortment of work pieces. Other types of systems may involve human inspection of work piece products. Such systems inherently involve human error such that a higher degree of nonconforming parts may go undetected. Furthermore, when human inspection systems are constructed as**

separate "inspection stations" apart from the value added work operations, manufacturing costs are increased by allowing nonconforming work pieces to leave work stations.")

Regarding **claim 13**, Ryznar discloses recording the time duration while an operator is guided by said guide system. *-interpreted as- monitor cycle times of the individual operational steps and combined operations undertaken at the work station* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.")**

Regarding **claim 14**, Ryznar discloses displaying a recorded image and recorded time duration on a display device. *–interpreted as- operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed* **(para.0011 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The controller being programmable via at least one program screen displayable on a display device, the at least one program screen including at least one input field for entering and/or selecting indicia regarding sequential actions. The controller being further adapted to display at least one display screen on the display device during operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed.")**

Regarding **claim 21**, Ryznar discloses a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators. *-interpreted as- use of cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece* **(para.0004 of Ryznar, "Several methods of preventing the improper assembly of a work piece exist. One such method is the use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly**

assembled work piece. Automated machine vision systems, however, are expensive and are highly customized such that they are only able to handle a limited assortment of work pieces. Other types of systems may involve human inspection of work piece products. Such systems inherently involve human error such that a higher degree of nonconforming parts may go undetected. Furthermore, when human inspection systems are constructed as separate "inspection stations" apart from the value added work operations, manufacturing costs are increased by allowing nonconforming work pieces to leave work stations.")

Regarding **claim 22**, Ryznar discloses wherein said guide system controller records images and time durations while an operator is guided by said guide system. *-interpreted as- provide and relay information to operator images of a work piece and monitor cycle times of the individual operational steps and combined operations undertaken at the work station* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations**

undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers."; para.0024 of Ryznar, "The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.")

Regarding **claim 23**, Ryznar discloses q monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor. *-interpreted as-provide information to operator images of a work piece and monitor cycle times of the individual operational steps and combined operations undertaken at the work station* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to**

monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers."; para.0024 of Ryznar, "The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.")

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher E. Everett whose telephone number is (571)272-2851. The examiner can normally be reached on Monday through Friday from 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Lo can be reached on 571-272-9774. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher E. Everett/
Primary Examiner, Art Unit 2121

PTO/SB/08a (01-10)
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(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	Robert E. Fennema
Attorney Docket Number	RYZ01 P-101A

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	Robert E. Fennema
Attorney Docket Number	RYZ01 P-101A

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	1	Search Report issued by the European Patent Office for corresponding and co-pending European Application No. 12744452.9 dated July 24, 2015.	

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EXAMINER SIGNATURE

Examiner Signature	/Christopher E. Everett/ (04/25/2016)	Date Considered	

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(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2127
Examiner Name	Robert E. Fennema
Attorney Docket Number	RYZ01 P-101A

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2016-03-28
Name/Print	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	Christopher E Everett	2121

CPC- SEARCHED		
Symbol	**Date**	**Examiner**
G05B19/02	10-6-15	ATW

CPC COMBINATION SETS - SEARCHED		
Symbol	**Date**	**Examiner**

US CLASSIFICATION SEARCHED			
Class	**Subclass**	**Date**	**Examiner**
700	95	10-6-15	ATW

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
EAST	10-6-15	ATW
Search of PALM using inventor searches	4/25/2016	CEE
Search of EAST using inventors, assignee, and text searches	4/25/2016	CEE
Search of 700/95 using text searches	4/25/2016	CEE
Search of (G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001) using text searches	4/25/2016	CEE

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**

	/CHRISTOPHER E EVERETT/ Primary Examiner.Art Unit 2121

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 05/23/2016

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER
EVERETT, CHRISTOPHER E

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
05/23/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sytsma@glbf.com
patents@glbf.com
clark@glbf.com

Amazon Ex. 1002.0297

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/984,744	RYZNAR ET AL.	
	Examiner	Art Unit	
	Christopher E. Everett	2121	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Christopher E. Everett*. (3)_____.

(2) *Karl T. Ondersma, Reg. No. 55,894*. (4)_____.

Date of Interview: *18 May 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *U.S. Patent Publication No. 2008/0121168 (Ryznar)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative, Karl Ondersma, and Examiner Christopher E. Everett discussed the technology within the patent application including the input signal and the addressed display features. Applicant's representative and Examiner discussed the difference between the prior art and the technology. In particular, Applicant's representative and Examiner discussed how the prior art was directed to pre-determined sequences of visual indicators and the technology can be programmed for dynamic sequences of visual indicators. Applicant's representative and Examiner discussed claim 1 with respect to the overview of the technology and the cited prior art (Ryznar). Examiner suggested amending claim 1 to further describe the programming of dynamic sequences of visual indicators as illustrated in figure 3A. No agreement was reached with respect to the proposed claim amendments. However, Examiner agreed to review proposed claim amendments before submission of the response to the Office Action.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/Christopher E. Everett/ Primary Examiner, Art Unit 2121	

Electronic Acknowledgement Receipt

EFS ID:	26191962
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma/Leslie Vredeveld
Filer Authorized By:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	28-JUN-2016
Filing Date:	09-AUG-2013
Time Stamp:	10:48:57
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Internet Communications Authorized	CommunicationAuthorization-RYZ01P101A.pdf	80559 6b30e619a991c50307a5f1e252f56392d9b9db9f	no	2

Warnings:

Information:	
Total Files Size (in bytes):	80559

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: ECOMM.AUTH/ECOMM.WTDW
Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

AUTHORIZATION FOR INTERNET COMMUNICATIONS IN A PATENT APPLICATION OR REQUEST TO WITHDRAW AUTHORIZATION FOR INTERNET COMMUNICATIONS		
	Application No.	13/984,744
	Filing Date	August 9, 2013
	First Named Inventor	Paul Ryznar
	Art Unit	2121
	Examiner Name	Christopher E. Everett
	Practitioner Docket No.	RYZ01 P-101A

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. To authorize permission for Internet Communications.

☑ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 55894.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Karl T. Ondersma/ — Signature

June 28, 2016 — Date

Karl T. Ondersma — Typed or printed name

616-975-5500 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☐ * Total of 1 forms are submitted.

Privacy Act Statement

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 07/05/2016

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER
EVERETT, CHRISTOPHER E

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
07/05/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sytsma@glbf.com
patents@glbf.com
clark@glbf.com

Amazon Ex. 1002.0303

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/984,744	RYZNAR ET AL.	
	Examiner	Art Unit	
	Christopher E. Everett	2121	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Christopher E. Everett*. (3)_____.

(2) *Karl T. Ondersma, Reg. No. 55,894*. (4)_____.

Date of Interview: *28 June 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *U.S. Patent Publication No. 2008/0121168 (Ryznar)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative, Karl Ondersma, and Examiner Christopher E. Everett discussed the technology within the patent application including the input signal and the addressed display features. Applicant's representative and Examiner discussed the difference between the prior art and the technology. In particular, Applicant's representative and Examiner discussed how the prior art was directed to pre-determined sequences of visual indicators and the technology can be programmed for dynamic sequences of visual indicators. Applicant's representative and Examiner discussed the proposed amendments to claim 1 (see attached) with respect to the technology and the cited prior art (Ryznar). Examiner agreed that the proposed amendments to claim 1 would overcome the cited prior art (Ryznar). Applicant's representative and Examiner discussed the need for additional consideration and/or search in view of the proposed amendments to claim 1.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☒ Attachment

/Christopher E. Everett/ Primary Examiner, Art Unit 2121	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

1. (currently amended) A method of projecting visual indicators ~~onto a physical object~~ to guide actions of an individual for a particular guided operation, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of selectable addressed display features with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;

~~providing~~receiving a sequence of one or more input signals ~~to~~ at said guide system controller, with the input signals being provided to said guide system controller by a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation;

selecting one or more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals, wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature; and

projecting one or more visual indicators corresponding to said selected particular addressed display features onto ~~the~~ one or more physical objects associated with the particular guided operation, with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals;

~~said input signals being transmitted from a separate system or controller to said guide system controller and each said addressed display feature having a pre-programmed individual address within said guide system controller, and~~ wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the particular operation ~~physical object~~.

2. (previously presented) The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further comprises projecting visual indicators corresponding to said selected addressed display

features onto a physical object at a location corresponding to said selected positional identifiers.

3. (previously presented) The method of claim 1, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

4. (previously presented) The method of claim 3, wherein said manufacturing execution system receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said manufacturing execution system from said sensor apparatus.

5. (previously presented) The method of claim 1, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signals are provided to said guide system controller from said system controller.

6. (previously presented) The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. (original) The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. (original) The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. (previously presented) The method of claim 1, wherein said visual indicators comprise at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. (previously presented) The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual

based on one or more of said visual indicators.

11. (original) The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. (previously presented) The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.

13. (original) The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. (original) The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. (previously presented) A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a pre-programmed individual address within said guide system controller;

said guide system controller receiving input signals with said guide system controller causing said directional light device to project visual indicators corresponding to an addressed display feature onto a physical object at a location corresponding to a positional identifier based on said input signals, wherein said guide system controller is operative to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the physical object.

16. (previously presented) The guide system of claim 15, wherein said guide system controller is interfaced with a manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

17. (previously presented) The guide system of claim 15, wherein said guide system controller is interfaced with a system controller that controls the operation of an automated process, and wherein said input signals are provided to said guide system controller from said system controller.

18. (previously presented) The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

19. (original) The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. (original) The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. (previously presented) The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators.

22. (original) The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. (original) The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. (new) The method of claim 1, further comprising receiving a display feature input signal at

said guide system controller provided by said separate computer system or controller, said display feature input signal including information to be projected by said projector with said guide system controller operatively receiving said display feature input signal and controlling said projector to project a visual indicator including the information to be projected that is included in said display feature input signal.

25. (new) The method of claim 24, wherein the information to be projected included in said display feature input signal comprises at least one selected from the group consisting of numbers, words, alphanumeric characters and a drawing image.

PATENT
RYZ01 P-101A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Confirmation No.	:	1049
Group Art Unit	:	2121
Examiner	:	Christopher E. Everett
Applicant	:	Paul Ryznar and James Ryznar
Serial No.	:	13/984,744
Filed	:	August 9, 2013
For	:	**LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD**
Customer No.	:	15671

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

RESPONSE

Responsive to the Final Office Action mailed April 28, 2016, Applicants submit a Request for Continued Examination and wish to amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

Remarks:

Applicants' undersigned representative thanks the Examiner for the courtesies extended during the telephonic interviews of May 18, 2016 and June 28, 2016. The remarks presented herein are believed to be fully responsive to the Office Action dated April 28, 2016, and to be in accordance with the telephonic interviews.

Claims 1-25 are pending in the application. Claims 1, 3, 5 and 15-17 are amended, and new claims 24 and 25 are added, as set forth above. The below comments are fully supported in the specification and drawings as originally filed. No new matter has been added.

CLAIM OBJECTIONS:

The Office Action objected to claim 1 based on the phrase "selecting addressed display features", and in particular as to whether these addressed display features being selected are the same or different from the plurality of addressed display features. Applicants have amended claim 1 as set forth above to state that the addressed display features are selected "from the plurality of said addressed display features" to clarify that they are the previously set forth display features.

The Office Action objected to claims 1 and 15 based on the phrase "said addressed display feature" as lacking antecedent basis. Applicants have amended claims 1 and 15 as set forth above and respectfully submits that claims 1 and 15 provides antecedent basis for the phrases in the claims.

Applicants respectfully request review of the claims and withdrawal of the noted objections.

CLAIM REJECTIONS – 35 U.S.C. §102:

Claims 1-23 were rejected under 35 U.S.C. §102(b) as being anticipated by Ryznar et al. (U.S. Pub. No. 20080121168 A1). Applicants respectfully traverse the rejections, however, in order to expedite prosecution, claims 1 and 15 have been amended as set forth above to further clarify the claimed method and system.

Claim 1 has been amended as presented and discussed during the telephonic interview of June 28, 2016. As noted in the Interview Summary dated July 5, 2016, Applicants

understand amended claim 1 to overcome the rejection of claim 1 based on Ryznar. As such, Applicants therefore respectfully submit that the rejections of claims 2-14 are likewise overcome, with claims 3 and 5 having been amended for clarity based on the amendments to claim 1.

Claim 15 has been amended in accordance with the amendments to claim 1 such that Applicant respectfully submits that the amendments to claim 15 overcome the rejection based on Ryznar. Applicants further respectfully submit that claims 16-23 likewise overcome the rejections based on Ryznar, with claims 16 and 17 having been amended for clarity based on the amendments to claim 15.

NEW CLAIMS:

New claims 24 and 25 have been added, with claim 24 depending from claim 1 and claim 25 depending from claim 24.

Claim 24 specifies that the method further comprises receiving a display feature input signal at the guide system controller provided by the separate computer system or controller, with the display feature input signal including information to be projected by the projector with the guide system controller operatively receiving the display feature input signal and controlling the projector to project a visual indicator including the information to be projected that is included in the display feature input signal.

Claim 25 in turn specifies that the information to be projected included in the display feature input signal comprises at least one selected from the group consisting of numbers, words, alphanumeric characters and a drawing image.

Support for new claims 24 and 25 is found in, for example, paragraphs [0073] and [0074] wherein it is discussed that data inputs 207 transmitted to a guide controller 220 of a guide system 200 may be directly projected by guide system 200.

Claims 1-25 are pending in the application. Applicants respectfully submit that independent claims 1 and 15 are neither disclosed nor suggested by Ryznar such that they are in condition for allowance, along with claims 2-14 and 16-25 depending therefrom, and a notice to that effect is earnestly and respectfully requested. The Examiner is invited to contact the undersigned at (616) 975-5500 should there be any questions or suggestions.

Respectfully submitted,

PAUL RYZNAR and JAMES RYZNAR

By: Gardner, Linn, Burkhart & Flory, LLP

Date: July 28, 2016

/Karl T. Ondersma/

Karl T. Ondersma
Registration No. 55894
2851 Charlevoix Drive, S.E., Suite 207
Grand Rapids, Michigan 49546
(616) 975-5500

KTO:lrv

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the present application. Claims 1, 3, 5 and 15-17 are amended, and new claims 24 and 25 are added.

1. (currently amended) A method of projecting visual indicators ~~onto a physical object~~ to guide actions of an individual for a particular guided operation, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of selectable addressed display features with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;

~~providing~~receiving a sequence of one or more input signals ~~to~~ at said guide system controller, with the input signals being provided to said guide system controller by a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation;

selecting one or more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals, wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature; and

projecting one or more visual indicators corresponding to said selected particular addressed display features onto ~~the~~ one or more physical objects associated with the particular guided operation, with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals;

~~said input signals being transmitted from a separate system or controller to said guide system controller and each said addressed display feature having a pre-programmed individual address within said guide system controller, and~~ wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the particular operation ~~physical object~~.

2. (previously presented) The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further comprises projecting visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers.

3. (currently amended) The method of claim 1, wherein the separate computer system or controller comprises a manufacturing execution system, and wherein said guide system controller is interfaced with ~~a~~said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

4. (previously presented) The method of claim 3, wherein said manufacturing execution system receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said manufacturing execution system from said sensor apparatus.

5. (currently amended) The method of claim 1, wherein the separate computer system or controller comprises a system controller that controls the operation of an automated process, and wherein said guide system controller is interfaced with ~~a~~said system controller ~~that controls the operation of an automated process~~, and wherein said input signals are provided to said guide system controller from said system controller.

6. (previously presented) The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. (original) The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. (original) The method of claim 5, wherein said system controller is interfaced with a

manufacturing execution system.

9. (previously presented) The method of claim 1, wherein said visual indicators comprise at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. (previously presented) The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on one or more of said visual indicators.

11. (original) The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. (previously presented) The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.

13. (original) The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. (original) The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. (currently amended) A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of

programmed selectable addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;

said guide system controller configured to receive~~ing~~ a sequence of one or more input signals from a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation, wherein said guide system controller is configured to select one or more particular addressed display features from the plurality of addressed display features based on the input signals, and wherein the input signals control selection of said addressed display features based on the address identifier for the said addressed display feature, with said guide system controller causing said directional light device to project visual indicators corresponding to an addressed display feature onto ~~a~~one or more physical objects at a location corresponding to a positional identifier based on said input signals, wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators ~~for the physical object~~.

16. (currently amended) The guide system of claim 15, wherein the separate computer system or controller comprises a manufacturing execution system, and wherein said guide system controller is interfaced with ~~a~~said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

17. (currently amended) The guide system of claim 15, wherein the separate computer system or controller comprises a system controller that controls the operation of an automated process, and wherein said guide system controller is interfaced with ~~a~~said system controller ~~that controls the operation of an automated process~~, and wherein said input signals are provided to said guide system controller from said system controller.

18. (previously presented) The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said

guide system controller based on said signals received by said system controller from said sensor apparatus.

19. (original) The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. (original) The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. (previously presented) The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators.

22. (original) The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. (original) The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. (new) The method of claim 1, further comprising receiving a display feature input signal at said guide system controller provided by said separate computer system or controller, said display feature input signal including information to be projected by said projector with said guide system controller operatively receiving said display feature input signal and controlling said projector to project a visual indicator including the information to be projected that is included in said display feature input signal.

25. (new) The method of claim 24, wherein the information to be projected included in said display feature input signal comprises at least one selected from the group consisting of numbers, words, alphanumeric characters and a drawing image.

Electronic Acknowledgement Receipt

EFS ID:	26483936
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma/Leslie Vredeveld
Filer Authorized By:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	28-JUL-2016
Filing Date:	09-AUG-2013
Time Stamp:	15:15:40
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$600
RAM confirmation Number	072916INTEFSW15171500
Deposit Account	505553
Authorized User	Karl Ondersma
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	01-Transmittal.pdf	264463 32cd7fd430a125033540fae974125449c1fd0863	no	2
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	02-RequestContinuedExamination.pdf	1349872 2d5ea8d102120a286440744338dfc92125c589f8	no	3
Warnings:					
Information:					
3	Response After Final Action	03-RESPONSEB.pdf	46279 c0c9672c2c3937f47287ca006b9123c5c43d2089	no	9
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30870 3b7a0bfe8fd5880ea458641344a03252b377ee2f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1691484		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	26483936
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma/Leslie Vredeveld
Filer Authorized By:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	28-JUL-2016
Filing Date:	09-AUG-2013
Time Stamp:	15:15:40
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$600
RAM confirmation Number	072916INTEFSW15171500
Deposit Account	0663
Authorized User	Karl Ondersma
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	01-Transmittal.pdf	264463 32cd7fd430a125033540fae974125449c1fd0863	no	2
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	02-RequestContinuedExamination.pdf	1349872 2d5ea8d102120a286440744338dfc92125c589f8	no	3
Warnings:					
Information:					
3	Response After Final Action	03-RESPONSEB.pdf	46279 c0c9672c2c3937f47287ca006b9123c5c43d2089	no	9
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30870 3b7a0bfe8fd5880ea458641344a03252b377ee2f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1691484		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	13984744
Filing Date:	09-Aug-2013
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Filer:	Karl T. Ondersma/Leslie Vredeveld
Attorney Docket Number:	RYZ01 P-101A

Filed as Small Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for Continued Examination	2801	1	600	600
		Total in USD ($)		**600**

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/984,744	Filing Date 08/09/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**140**
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	* 0	x $40 =	**0**
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	* 0	x $210 =	**0**
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**140**

APPLICATION AS AMENDED – PART II

AMENDMENT **07/28/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 29	= 0	x $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	x $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
JESSICA GAYNOR

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13/984,744	Filing Date	2013-08-09	Docket Number (if applicable)	RYZ01 P-101A	Art Unit	2121
First Named Inventor	Paul Ryznar			Examiner Name	Christopher E. Everett		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 505553

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2016-07-28
Name	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	2

Application Number	13/984,744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar et al.
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
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- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
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Firm Name	Gardner, Linn, Burkhart & Flory, LLP		
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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L12	4	(("RYZNAR") near3 ("Paul")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/15 15:39
L13	3	(("RYZNAR") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/15 15:39
L14	4	(ops adj2 solutions).as.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L15	4683	(G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001).cpc.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L16	1106	700/95.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L17	57264	(guide adj2 (system control controller))	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L18	74554	(project projector) adj5 (object work piece device)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L19	5702	L15 L16	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L20	48	L17 and L19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L21	53	L18 and L19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L22	98	L20 L21	US-	OR	ON	2016/08/15

			PGPUB; USPAT; FPRS; EPO			15:39
L23	478537	(guide visual indicator light projection) near4 (operator user)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L24	12652	(guide adj3 system).ab.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L25	193361	(pick place picking placing placement) adj4 (part component bin)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L26	11	L24 and L19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L27	13487	L23 and L25	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L28	625	L27 and 700/$.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L29	50	L28 and L19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
L30	136	L12 L13 L14 L20 L21 L22 L26 L29	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S1	20	("4469553" | "20060106483" | "20070180674" | "5341183" | "6317980" | "7193696" | "7433796" | "7463368" | "20040111901" | "20060059699" | "20060185181" | "2682117" | "3600785" | "3623066" | "3667104" | "3986244" | "4102568" | "4163309" | "4222036" | "7515981").PN.	US-PGPUB; USPAT	OR	ON	2016/04/25 12:38
S2	1	("20080121168").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/04/25 12:40
S3	3	(("RYZNAR") near3 ("Paul")).INV.	US-PGPUB; USPAT;	OR	ON	2016/04/25 12:41

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			USOCR			
S4	3	(("RYZNAR") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/04/25 12:41
S5	1	("2013/0325155").URPN.	USPAT	OR	ON	2016/04/25 12:41
S6	4	(ops adj2 solutions).as.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S7	4	S4 S5	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S8	3	S2 S4	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S9	3	S3 S4	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S10	4814	(G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001).cpc.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:57
S11	1106	700/95.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:57
S12	56653	(guide adj2 (system control controller))	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S13	72690	(project projector) adj5 (object work piece device)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S14	5833	S10 S11	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S15	572	S12 and S13	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S16	47	S12 and S14	US-PGPUB;	OR	ON	2016/04/25 14:00

			USPAT; FPRS; EPO			
S17	52	S13 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S18	96	S16 S17	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S19	464998	(guide visual indicator light projection) near4 (operator user)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
S20	47163	guide adj3 system	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
S21	127	S12 and S13 and S19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
S22	12930	(guide adj3 system).ab.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S23	190143	(pick place picking placing placement) adj4 (part component bin)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S24	12	S22 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S25	12988	S19 and S23	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S26	617	S25 and 700/$.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:04
S27	48	S26 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:04
S28	2	("7515981").PN.	US-PGPUB;	OR	OFF	2016/08/12 11:43

			USPAT; FPRS; EPO			
S29	28	("20030073541" | "2682117" | "3600785" | "3623066" | "3667104" | "3986244" | "4102568" | "4163309" | "4222036" | "4318222" | "4469553" | "4890382" | "5119536" | "5430662" | "5506641" | "5801946" | "5910894" | "6224385" | "6658218" | "7027886").PN. OR ("7515981").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/12 11:43
S30	10	("20050128437" | "20110179624" | "20110243380" | "20110314001" | "6600476" | "7515981" | "7530019" | "8027745" | "8162486" | "8199108").PN. OR ("9412053").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/12 11:45
S31	20	("20030163219" | "20040225390" | "20050058969" | "20060085088" | "4961148" | "5771043" | "6188402" | "6345207" | "6453209" | "6477437" | "6725184" | "6788987" | "6819965").PN. OR ("8027745").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/12 11:56
S32	1	("20110178627").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/12 13:53
S33	4	("7307542").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/15 10:00
S34	2	("5406176").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/15 10:06

EAST Search History (Interference)

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8/15/2016 3:41:20 PM
C:\Users\ceverett\Documents\EAST\Workspaces\13984744.wsp

Amazon Ex. 1002.0338

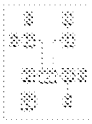
addressed lights for stage show

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Addressable light dimmer and addressing system



www.google.com/patents/US6175201

Grant - Filed Feb 26, 1999 - Issued Jan 16, 2001 - Alberto Sid - Maf Technologies Corp.

An addressable **lighting** device and control system uses a DMX ... with which a **lighting** program for a particular **stage show** can be set up.

Overview · Related · Discuss

Addressable light dimmer and addressing system



www.google.com/patents/US6369524

Grant - Filed Dec 14, 2000 - Issued Apr 9, 2002 - Alberto Sid - Maf Technologies Corp.

An addressable **lighting** device and control system uses a DMX-512 ... with which a **lighting** program for a particular **stage show** can be set up.

Overview · Related · Discuss

Controller panel and system for light and serially networked ...



www.google.com/patents/US6761470

Grant - Filed Feb 8, 2002 - Issued Jul 13, 2004 - Alberto Sid - Lowel-Light Manufacturing, Inc.

The controller operates in a local mode to control the integrated **light** only and ... and speed with which a **lighting** program for a particular **stage show** can be ... Known devices each contain a manually set **address** circuit which ...

Overview · Related · Discuss

Controller panel and system for light and serially networked ...



www.google.com/patents/US20040196140

App. - Filed Apr 23, 2004 - Published Oct 7, 2004 - Alberto Sid - Alberto Sid

The controller operates in a local mode to control the integrated **light** only ... which a **lighting** program for a particular **stage show** can be set up. ... programming the **addresses** of **lighting** control devices using a DMX protocol.

Overview · Related · Discuss

Computer controlled stage lighting system



www.google.com/patents/US5406176

Grant - Filed Jan 12, 1994 - Issued Apr 11, 1995 - Walter H . Sugden - Aurora Robotics Limited

1, this **shows** generally as 10, a computer controlled **stage lighting** ... Each automated lamp unit 12 has a unique protocol **address** so that each ...

Overview · Related · Discuss

Microscope stage having a sliding grease interface



www.google.com/patents/US5566021

Grant - Filed Mar 23, 1995 - Issued Oct 15, 1996 - James T. Pettingell - Pettingell; James T.

The grease and plates are arranged to allow **light** to be transmitted therethrough. ... of an illumination **light** source to an object being **addressed**. .... 2 **shows** the **stage** in detail as it may be positioned between the lens 21 and a ...

Overview · Related · Discuss

Electronically controlled stage lighting system



www.google.com/patents/US6622053

Grant - Filed May 22, 2000 - Issued Sep 16, 2003 - William Hewlett - Light And Sound Design Ltd.

an electronically-**addressed** **light** distribution system, which is **addressed** to ..... 5 **shows** a moving balance device for a moving optical element;.

Overview · Related · Discuss

Electronically controlled stage lighting system



www.google.com/patents/EP0986935B1?cl=en

Grant - Filed May 8, 1998 - Issued Dec 5, 2007 - William Light & Sound Design Ltd HEWLETT - Light & Sound Design, Ltd.

A cooled commanded lamp element (104) for use in **stage** **lighting**, comprising: .... These objectives and many others are **addressed** by the as described .... Figure 6 **shows** an alternative embodiment for the moving optical ...

Overview · Related · Discuss

Vertically adjustable overhead lighting system



www.google.com/patents/US6312139

Grant - Filed Nov 23, 1999 - Issued Nov 6, 2001 - Britt W. Baker - Pioneer Hi-Bred International, Inc.

Horizontal sway of the bar upon which the growth **lights** are mounted is ... Prior art has **addressed** the problems of delivering **light** by vertically adjustable ... The apparatus for delivering **light** to **stage** borders disclosed in U.S. Pat. ... None of the prior art teachings referred to above **show** or suggest that the ...

Overview · Related · Discuss

Lighting communication architecture



www.google.com/patents/US6175771

Grant - Filed Mar 3, 1998 - Issued Jan 16, 2001 - Mark A. Hunt - Light & Sound Design Ltd.

A **lighting** control system for **stage** **lighting** comprising: ... A description of an **addressed** format can be found in U.S. Pat. No. ... 2A and 2B respectively **show** standard DMX time division multiplexing, and the modified SC-DMX ...

Overview · Related · Discuss

Amazon Ex. 1002.0340

Tristable **operation** of antiferroelectric liquid crystal **light** valves optically **addressed** using amorphous silicon photosensor

T Oyama, T Masuda, S Hamada... - Japanese journal of ..., 1993 - iopscience.iop.org

... In this study, we have fabricated antiferroelectric liquid crystal **light** valves with tristable **operation** using the resistance change of amorphous silicon which is dependent on the ... Linear and Nonlinear **Operations** of Optically **Addressed** Spatial **Light** Modulators Using ...

Cited by 3 Related articles All 5 versions Cite Save

Making materials flow: a lean material-handling **guide** for **operations**, production-control, and engineering professionals

R Harris, C Harris, E Wilson - 2003 - books.google.com

... Making Materials Flow A lean material-handling **guide** for **operations**, production-control, and engineering professionals ... shift/target production per shift 552/690 690/690 Daily overtime per **light**-truck fuel ... In your **operation**, of course, the names for these activities may be different. ...

Cited by 38 Related articles Cite Save More

An nMOS **addressed** liquid crystal spatial **light** modulator

I Underwood - 1987 - era.lib.ed.ac.uk

... and Fabrication of the Spatial **Light** Modulator (The LCIC, The Spacer, The Perspex **Guide**, The Cover ... Sensitivity is of major importance in optically **addressed** SLMs ... Coherent Illumination 1.3.1 Coherent Optical Processing Optical Information Processing using coherent **light** is a ...

Cited by 11 Related articles All 5 versions Cite Save More

Electrically **Addressed** Smectic A Liquid Crystal Displays and their Liquid Crystal Microstructure

R Fagerberg, L Johnsen, JS Rambech... - ... Symposium Digest of ..., 1998 - Wiley Online Library

... solution we have resorted to the use of conventional crossed polarizers and back- **lights** for the ... Since scatter pixels depo- larize the incident **light**, these will appear white (bright), but the brightness is ... amplitude of 2/3 the pixel drive voltage (180V) were applied to **addressed** rows ...

Cited by 2 Related articles Cite Save

Cyclic fatigue testing of nickel-titanium endodontic instruments

JP Pruett, DJ Clement, DL Carnes - Journal of endodontics, 1997 - Elsevier

... A new method of canal curvature evaluation that **addressed** both angle and abruptness of curvature was ... Size #30 and #40 **Light**-speed instruments were placed through the **guide** tubes and the ... flexure of the shaft, corresponding to the midpoint of curvature within the **guide** tube ...

Cited by 772 Related articles All 8 versions Cite Save

Linear and nonlinear **operations** of optically **addressed** spatial **light** modulators using antiferroelectric liquid crystal

T Masuda, T Oyama, S Hamada... - Japanese journal of ..., 1994 - iopscience.iop.org

... Close. Linear and Nonlinear **Operations** of Optically **Addressed** Spatial **Light** Modulators Using Antiferroelectric Liquid Crystal. Taro Masuda, Tsuyoshi Oyama, Shouji Hamada, N. Shinichi Takahashi, Ichiro Kawamura 1 and Takashi Hagiwara 1. ...

Cited by 1 Related articles All 7 versions Cite Save

Visual angle of the mind's eye before and after unilateral occipital lobectomy.

MJ Farah, MJ Soso, RM Dasheiff - Journal of Experimental ..., 1992 - psycnet.apa.org

... Correspondence concerning this article should be **addressed** to Martha J. Farah. ... subjects kept their eyes closed, and the room was darkened by turning off the **lights** and drawing ... This prevented subjects from using the visual angle of visible **light** to **guide** their responses in the ...

Cited by 150 Related articles All 6 versions Cite Save

Temperature dependence of resonant frequency in all-fibre optically **addressed** silicon microresonator sensors

YJ Rao, D Walsh, D Uttamchandani... - Electronics ..., 1991 - ieeexplore.ieee.org

... safe, E/M interference free silicon microresonator sensor head, and demonstrate the **operation** of an ... two singlemode optical fibres in the sensor head is used to **guide** **light** from a ... 2 shows the schematic diagram of the all-fibre optically **addressed** microresonator sensor system. ...

Cited by 12 Related articles All 7 versions Cite Save

Application of polymer **light**-emitting materials in **light**-emitting diodes, backlights and displays

RJ Visser - Philips journal of research, 1998 - Elsevier

... sources, advertising and potentially rear **lights** and brake **lights** for cars. ... This comparison is made with a 2 x 4 cm2 backlight based on a **light guide** and four LEDs. 4.2. ... ranging from small monochrome segmented dis- plays to large full-colour displays can be **addressed** with this ...

Cited by 40 Related articles All 3 versions Cite Save

Bistability and nonlinearity in optically **addressed** ferroelectric liquid-crystal spatial **light** modulators: applications to neurocomputing

M Killinger, JLB de la Tocnaye, P Cambon… - Applied …, 1992 - osapublishing.org

... be an alternative to encoding the connection weights by spatial multiplexing of a number of binary pixels with an electrically **addressed** FLC, as ... 4 Nonlinear optical response of the BOASLM as a function of the write-**light** intensity. ... The dashed curve serves as a **guide** to the eye. ...

Cited by 16 Related articles All 6 versions Cite Save

About 59,100 results (0.46 seconds)

Matrix-type image display with light-guide addressing system



www.google.com/patents/US3700802

Grant - Filed Dec 21, 1970 - Issued Oct 24, 1972 - Joseph Markin - Zenith Radio Corp

Associated with each **light**-displaying element is a photoconductor or other ... Matrix-type image display with **light-guide addressing** system ..... In **operation**, an ac or d.c. energizing potential may be continually maintained, ...

Overview · Related · Discuss

Remote-control operating system and method for selectively ...



www.google.com/patents/US4459591

Grant - Filed Jan 22, 1982 - Issued Jul 10, 1984 - Georg Haubner - Robert Bosch Gmbh

particularly to selectively **address** and control **operation** of accessory .... System according to claim 11, wherein the **light guide** fiber (24) ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/EP2673592A1?cl=en

App. - Filed Feb 10, 2012 - Published Dec 18, 2013 - Paul Ryznar - OPS Solutions Llc

The **guide** system controller may also include a plurality of positional ... selecting an **addressed** display feature based on said input signal; and .... [0004] In addition to manufacturing assembly **operations**, numerous other ...

Overview · Related · Discuss

Ambient light adaptation for dynamic foil displays



www.google.com/patents/WO2004059605A2?cl=en

App. - Filed Dec 4, 2003 - Published Jul 15, 2004 - Woudenberg Roel Van - Koninklijke Philips Electronics N.V.

-selecting (1202) a mode of **operation** from a set of at least two modes of ..... In an **Address**- While-Display scheme, the **light** in the **light guide** is ...

Overview · Related · Discuss

Display device comprising a light guide



www.google.com/patents/EP1532613A1?cl=en

App. - Filed Jul 4, 2003 - Published May 25, 2005 - Tijsbert M. H. Creemers - Philips Electronics N.V.

The display device can be **addressed** by a multiple line **addressing** ... 3 in **operation**, forces pulling the membrane 3 against the **light guide** 2 or ...

Overview · Related · Discuss

Display device comprising a light guide



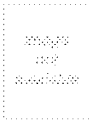
www.google.com/patents/US20060001786

App. - Filed Jul 4, 2003 - Published Jan 5, 2006 - Tijsbert Creemers - Koninklijke Philips Electronics N.V.

On one side of the **light guide light** from a **light** source is coupled in the **light guide**; when the ... The display device can be **addressed** by a ... The invention also relates to a method for **operating** a dynamic display device. [0002].

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/WO2012109593A1?cl=en

App. - Filed Feb 10, 2012 - Published Aug 16, 2012 - Paul Ryznar - OPS Solutions, LLC

The **guide** system controller (220) may also include a plurality of positional ... selecting an **addressed** display feature based on said input signal; and .... [0004] In addition to manufacturing assembly **operations**, numerous other ...

Overview · Related · Discuss

Light guided assembly system and method



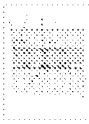
www.google.com/patents/US20130325155

App. - Filed Feb 10, 2012 - Published Dec 5, 2013 - Paul Ryznar - Ops Solutions Llc

The **guide** system controller may also include a plurality of positional ... selecting an **addressed** display feature based on said input signal; and .... In addition to manufacturing assembly **operations**, numerous other activities ...

Overview · Related · Discuss

Display device comprising a light guide



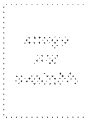
www.google.com/patents/US6908217

Grant - Filed Jan 17, 2003 - Issued Jun 21, 2005 - Gerardus G. P. van Gorkom - Koninklijke Philips Electronics N.V.

A display device includes an ultraviolet **light** (UV **light**) source, a **light guide**; ... in which, in **operation**, **light** is generated and trapped (so that this plate forms a .... UV **light** leaves the **light guide** at the **addressed** position, enters ...

Overview · Related · Discuss

Display device comprising a light guide



www.google.com/patents/EP1073925A1?cl=en

App. - Filed Jan 17, 2000 - Published Feb 7, 2001 - Gorkom Gerardus G. P. Van - Philips Electronics N.V.

The UV radiation is led into a **light guide**, and at **addressed** ... in **operation**, **light** is generated and trapped (so that this plate forms a **light guide**), ...

Overview · Related · Discuss

Amazon Ex. 1002.0344

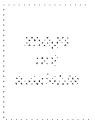
addressed visual indicators guided operation

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Light guided assembly system and method



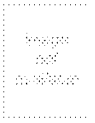
www.google.com/patents/EP2673592A1?cl=en

App. - Filed Feb 10, 2012 - Published Dec 18, 2013 - Paul Ryznar - OPS Solutions Llc

A **guide** system and method of projecting **visual indicators** onto a physical ... projects a **visual indicator** corresponding to the selected **addressed** ... [0004] In addition to manufacturing assembly **operations**, numerous other ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/WO2012109593A1?cl=en

App. - Filed Feb 10, 2012 - Published Aug 16, 2012 - Paul Ryznar - OPS Solutions, LLC

A **guide** system and method of projecting **visual indicators** onto a ... projects a **visual indicator** corresponding to the selected **addressed** display feature ... the **operation** of an automated process, and wherein said input signal is ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/US20130325155

App. - Filed Feb 10, 2012 - Published Dec 5, 2013 - Paul Ryznar - Ops Solutions Llc

A **guide** system and method of projecting **visual indicators** onto a physical ... projector projects a **visual indicator** corresponding to the selected **addressed** ... with a system controller that controls the **operation** of an automated ...

Overview · Related · Discuss

Eyewear operational guide system and method



www.google.com/patents/WO2015006334A1?cl=en

App. - Filed Jul 8, 2014 - Published Jan 15, 2015 - Paul Ryznar - Ops Solutions Llc

providing a confirmation signal to said **guide** system controller upon ... said **guide** system controller includes a plurality of **addressed** display features, and ... with a system controller that controls the **operation** of an automated process, ... A **guide** system adapted to provide **visual indicators** to an individual to ...

Overview · Related · Discuss

Visual guidance and verification for interconnecting nodes



www.google.com/patents/US20080104275

App. - Filed Oct 31, 2006 - Published May 1, 2008 - Jason Robert Almeida - Jason Robert Almeida

computer usable program code for **operating** a **visual indicator** ... a node is a processing location having a unique network **address**. ... and associated **visual indicators** for **guided** connection to a networked computer system.

Overview · Related · Discuss

Dental tools for guided surgery



www.google.com/patents/US9039413

Grant - Filed Dec 15, 2010 - Issued May 26, 2015 - Edmund Suter - Straumann Holding Ag

Surgical tool for use in **guided surgery** having a ... By providing tools with only **visual** depth **indicators** the flexibility available to

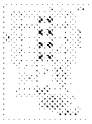
the dentist or ... It is therefore a problem **addressed** by the present invention to improve the ...
Overview · Related · Discuss

Indicator guide for improved instrument navigation in image-guided ...



www.google.com/patents/WO2013109527A1?cl=en
App. - Filed Jan 15, 2013 - Published Jul 25, 2013 - Willet F. Whitmore, Iii - Civco Medical Instruments Co., Inc.
The **indicator guide** includes a display responsive to the output signals for providing a **visual** indication of the path the instrument should take to reach the ... The subject invention **addresses** those needs by providing a new ... (user's) **visual** field that is most convenient (e.g., on the back of the **operating** hand ...
Overview · Related · Discuss

Power patch panel with guided MAC capability



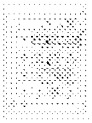
www.google.com/patents/US7768418
Grant - Filed Nov 29, 2006 - Issued Aug 3, 2010 - Ronald A. Nordin - Panduit Corp.
Coordination of **guided** MAC **operations** may be performed by the patch ... activates **visual indicators** on the display to identify communication equipment and ..... System and method for **addressing** and tracing patch cords in a ...
Overview · Related · Discuss

Dental tools for guided surgery



www.google.com/patents/EP2340783A1?cl=en
App. - Filed Dec 10, 2010 - Published Jul 6, 2011 - Edmund Suter - Straumann Holding AG
The present invention relates to a surgical tool (1) for use in **guided surgery** ... In addition, or alternatively, **visual indicators** can be provided on the drill head or ... It is therefore a problem **addressed** by the present invention to ...
Overview · Related · Discuss

Passive program completion status indicator for an electronic ...



www.google.com/patents/US7203952
Grant - Filed Mar 27, 2001 - Issued Apr 10, 2007 - Charles R. Broadus - Digeo, Inc.
displaying an electronic program **guide** (EPG) having first and .... The separate **visual** indication may be embodied, for example, as a pie ... by specifying the corresponding **address**, after which the network 101 ... in one embodiment, for convenient remote **operation** of the STB 102 and the television 104.
Overview · Related · Discuss

Amazon Ex. 1002.0346

Order Out of Chaos: **Assembly** of ligand binding sites in heparan sulfate 1

JD Esko, SB Selleck - Annual review of biochemistry, 2002 - annualreviews.org

... disaccharides are required to bind thrombin, and binding does not exhibit **any** specificity with ... A major goal in the field is to elucidate the factors that **guide** the production ... 2. THE FORMATION OF HEPARAN SULFATE. TOPOLOGY OF HEPARAN SULFATE **ASSEMBLY**. HOW ARE ...

Cited by 1134 Related articles All 8 versions Cite Save

The unified modeling language user **guide**

G Booch - 2005 - Pearson Education India

Cited by 11355 Related articles All 84 versions Cite Save More

In vitro papillomavirus capsid **assembly** analyzed by **light** scattering

GL Casini, D Graham, D Heine, RL Garcea, DT Wu - Virology, 2004 - Elsevier

... cell chaperone proteins (Cripe et al., 1995), and in vitro studies suggest that these chaperones may **guide** the carboxy ... **Assembly** measurements. Multi-angle **light** scattering using a DAWN-DSP (Wyatt Technology Corporation) instrument running Astra 4.73.04 software was used ...

Cited by 113 Related articles All 6 versions Cite Save

JIT factory revolution: A pictorial **guide** to factory design of the future

H Hirano - 1989 - books.google.com

... Flow Manufacturing 66 Cellular Shop 68 U-Shaped Line 70 Cellular Manufacturing and **Assembly** 74 Multi ... Visual Control 174 Andon (Line-Stop Alarm **Light**) 177 Signboards 178 14. ... for giving me the opportunity to contribute to JIT Factory Revolution: A Pictorial **Guide** to Factory ...

Cited by 74 Related articles Cite Save More

Effect of **light** intensity and exposure duration on cure of resin composite

FA Rueggeberg, WF Caughman, JW Curtis - Operative dentistry, 1994 - jopdentonline.org

... to monitor lamp voltage quartz tungsten-halogen **light** source slot for neutral density filter 9 mm fiber optic **guide** Figure 1 ... The authors would like to express their gratitude to the Demetron Corporation for funding of this study, providing the **light** source **assembly**, the source ...

Cited by 579 Related articles All 6 versions Cite Save

Macroscopic 10-terabit–per–square-inch arrays from block copolymers with lateral **order**

S Park, DH Lee, J Xu, B Kim, SW Hong, U Jeong... - ..., 2009 - science.sciencemag.org

... This pair of defects is not associated with **any** defect on the underlying substrate but originates from the BCP self-**assembly**. ... The self-**assembly** overrides substrate defects and uses the topography only as a **guide** to the orientation of the arrays. ...

Cited by 569 Related articles All 14 versions Cite Save

Curves and surfaces for CAGD: a practical **guide**

GE Farin - 2002 - books.google.com

... Curves and Surfaces for CAGD A Practical **Guide** Fifth Edition Gerald Farin Arizona State University M ... Prior to that, ships were built "hands on" without **any** mathematics being involved. ... is concerned with the repre- sentation of objects that are enclosed by an **assembly** of surfaces ...

Cited by 2195 Related articles All 7 versions Cite Save More

Physiological comparison of three interventions in **light assembly** work: reduced work pace, increased break allowance and shortened working days

SE Mathiassen, J Winkel - International archives of occupational and ..., 1996 - Springer

... It is generally agreed that repeated manipulation of **light** components for extended durations is associated with ... of the exposure, but at present it is not possible to specify **any** such variable ... Fig 1 The **assembly** work station at the reference company (left) and in the laboratory (right ...

Cited by 104 Related articles All 8 versions Cite Save

Laser **guide** star adaptive optics at the Keck Observatory

AR Contos, PL Wizinowich... - Astronomical ..., 2003 - proceedings.spiedigitallibrary.org

... The **light** is collimated and then passes through a lenslet array, mounted on an XY motorized stage with manual rotation adjustment. ... A three-dimensional drawing of the **assembly** is shown in Figure 3. (14) The XY lenslet Proc. of SPIE Vol. 4839 373 ... 4. LASER **GUIDE** STAR ...

Cited by 19 Related articles All 5 versions Cite Save

Integrated optics: an introduction

SE Miller - Bell System Technical Journal, 1969 - Wiley Online Library

... If realized, this new art would facilitate isolating the laser circuit **assembly** from thermal, mechanical ... may be obtained from equation (2) or Table I. By using a **guide** which confines the ... Previous Work on fiber-optics for image transmission or incoherent **light** sensing has provided a ...

Cited by 596 Related articles All 4 versions Cite Save

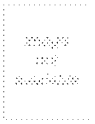
Google light assembly guide in any order

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Light assembly of pre-defined shape



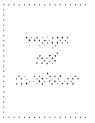
www.google.com/patents/EP1730439A1?cl=en

App. - Filed Mar 31, 2005 - Published Dec 13, 2006 - Ira Kay - Quantum Leap Research Inc.

The **light assembly** comprises a housing provided with suitable optics ... to be removably attached to a mating **guide** provided on **any** convenient device' .... mount it on his/her weapon in **order** to proceed to a precise triggering.

Overview · Related · Discuss

Removable light assembly of pre-defined shape for a weapon



www.google.com/patents/CA2463009A1?cl=en

App. - Filed Apr 1, 2004 - Published Oct 1, 2005 - Ira Kay - Quantum Leap Research Inc.

The **light assembly** comprises a housing provided with a reflector having a ... said lower portion of the latch, for engaging **any** one of said cross-slots, ... A of the housing is at least as close as possible to the **guide** 20 in **order** to ...

Overview · Related · Discuss

Light assembly of pre-defined shape



www.google.com/patents/US20060026882

App. - Filed Mar 31, 2005 - Published Feb 9, 2006 - Rodney Miller - Miller Rodney H

The **light assembly** comprises a housing provided with suitable optics ... to be removably attached to a mating **guide** provided on **any** convenient device .... mount it on his/her weapon in **order** to proceed to a precise triggering.

Overview · Related · Discuss

Removable light assembly of pre-defined shape for a weapon



www.google.com/patents/US7305790

Grant - Filed Apr 1, 2004 - Issued Dec 11, 2007 - Ira Kay - Quantum Leap Research Inc.

A **light assembly**, for removable attachment to a **guide** provided on a weapon, ... readily mount it on his weapon in **order** to proceed to a precise triggering. .... an M1913 rail or **any** equivalent thereof, to engage a **light assembly** ...

Overview · Related · Discuss

Light guide for vehicle lamp assembly



www.google.com/patents/US8057081

Grant - Issued Nov 15, 2011 - Leo F. Schwab - GM Global Technology Operations LLC

A **light guide** and various vehicular lamp **assemblies** using the same ... "fifth" in **any order** in the drawings (e.g., top to bottom, bottom to top, etc.) ...

Overview · Related · Discuss

Display assembly and methods



www.google.com/patents/US8740436

Grant - Filed Feb 10, 2011 - Issued Jun 3, 2014 - James A. Yasukawa - Dell Products L.P.

A display **assembly** is disclosed providing a panel display, a **light** guiding ... the **light** towards the panel display and the second surface of the **light guide**. ... and/or mentioned above, and performance of the steps in **any order**.

Amazon Ex. 1002.0349

Overview · Related · Discuss

Light guide plates and light guide plate assembly utilizing ...



www.google.com/patents/US5703667

Grant - Filed Aug 8, 1996 - Issued Dec 30, 1997 - Shin-Ichiro Ochiai - Shimada Precision, Co., Ltd.

The **light guide** plate has a diffraction grating printed or worked on a ... in **order** to compensate for **any** loss in the quantity of **light** conducted to ...

Overview · Related · Discuss

Lighting Assembly for New and Retrofitting Applications



www.google.com/patents/US20120262920

App. - Filed Apr 13, 2012 - Published Oct 18, 2012 - William J. Longardner - Longardner William J

The retrofit **lighting assembly** includes a base configured to engage the ... In **order** to use more efficient **light** sources to illuminate a particular area, the entire .... The invention includes **any** alterations and further modifications in the ..... Conventional fasteners may be positioned through **guides** 85 of vertical ...

Overview · Related · Discuss

Light wave coupling into thin film light guides



www.google.com/patents/US3674335

Grant - Filed May 25, 1970 - Issued Jul 4, 1972 - Ashkin Arthur - Bell Telephone Labor Inc

A thin film **light guide** 13, of **any** suitable transparent **light** guiding material, ... which is re- 3 flected back out of the **assembly**, and the +1 **order**, ...

Overview · Related · Discuss

Light guide with a printed film



www.google.com/patents/US20130286687

App. - Filed Jun 15, 2012 - Published Oct 31, 2013 - Martin A. Kykta - Unipixel Displays, Inc.

A method for making a **light guide** includes transferring ink onto a master tool ... The printed patterns have **any** desired geometry and form the **light** .... **assembly** 402 in **order** to reflect back the **light** injected into the **light guide** by ...

Overview · Related · Discuss

Amazon Ex. 1002.0350

About 51,200 results (0.41 seconds)

Switch bezel with visual indicator



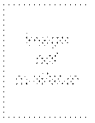
www.google.com/patents/US4004120

Grant - Filed Jul 17, 1975 - Issued Jan 18, 1977 - Ivan A. Lee - C & K Components, Inc.

A switch bezel with a **visual indicator** mounted thereto. ... The **indicator** could be **any** alpha-numeric display or modular device, and it may be ... Spring brackets 36 **project** outwardly on opposite sides of switch **assembly** 18 ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/WO2012109593A1?cl=en

App. - Filed Feb 10, 2012 - Published Aug 16, 2012 - Paul Ryznar - OPS Solutions, LLC

A guide system and method of projecting **visual indicators** onto a physical object to ... based on the input signal and the projector (266) **projects** a **visual indicator** ... tasks that are desired to be performed without omitting **any** steps. .... in the proper **order**, as well as additional information regarding cycle times ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/EP2673592A1?cl=en

App. - Filed Feb 10, 2012 - Published Dec 18, 2013 - Paul Ryznar - OPS Solutions Llc

A guide system and method of projecting **visual indicators** onto a physical ... signal and the projector **projects** a **visual indicator** corresponding to the selected ... tasks that are desired to be performed without omitting **any** steps. .... in the proper **order**, as well as additional information regarding cycle times and ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/US20130325155

App. - Filed Feb 10, 2012 - Published Dec 5, 2013 - Paul Ryznar - Ops Solutions Llc

A guide system and method of projecting **visual indicators** onto a physical ... the input signal and the projector **projects** a **visual indicator** corresponding to ... A motion sensor may be incorporated with **any** of the guide systems, with .... in the proper **order**, as well as additional information regarding cycle times ...

Overview · Related · Discuss

Multimedia alarm clock projector



www.google.com/patents/US8593912

Grant - Filed Apr 18, 2012 - Issued Nov 26, 2013 - William Amores - William Amores

A multimedia alarm clock projector having a housing **assembly**, a speaker system, ... The projector **projects** a **visual** projection at **any** angle between a ... an alarm **indicator**, and auxiliary **indicator**, a radio **indicator**, a universal ...

Overview · Related · Discuss

Visual stock record indicator

www.google.com/patents/US2236783

Grant - Filed Sep 5, 1939 - Issued Apr 1, 1941 - Louis S Rothschild - Louis S Rothschild



My invention relates to a visual stock record indicator and more particularly to a device ... Each of the indicating assemblies comprises aholder 3 made of metal or of any other ... In this position, the sliding members will project above the holders 3. ... faithful record of the merchandise on hand or on order at any particular time.
Overview · Related · Discuss

Strain indicator



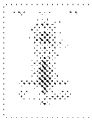
www.google.com/patents/US4041776
Grant - Filed Mar 22, 1976 - Issued Aug 16, 1977 - William J. Payne - Modulus Corporation
The invention of claim 8 in which said indicator assembly is defined by a ... of the fastener that is being sensed in order to determine a decreased load on the fastener. ... a visual indication of the fact that the fastener is no longer under load. ... of indicator element 36 to project out of the indicator assembly 32.
Overview · Related · Discuss

Method for integrating an indicator light in a connector assembly



www.google.com/patents/US20080220645
App. - Filed Feb 19, 2008 - Published Sep 11, 2008 - Michael Feldman - Sangoma Technologies Corporation
The visual indication illuminates the interior surface of the connector ... Method for integrating an indicator light in a connector assembly ... is configured to project light through a light transfer passage into the .... 3B is an exemplary illustration of an embodiment of the present invention with no plug inserted:.
Overview · Related · Discuss

Retractable visual indicator assembly



www.google.com/patents/US5727498
Grant - Filed Feb 13, 1996 - Issued Mar 17, 1998 - George R. Hackler - The United States Of America As Represented By The Administrator Of The National Aeronautics And Space Administration
A retractable indicator assembly 10 may be mounted on a container C which ... in order to ensure that the filtering media will be timely changed. ... projects upwardly within a transparent tube mounted above the chamber in the tank. ... for preventing leakage of any gas from the barrel during retraction and ...
Overview · Related · Discuss

Visual position indicator for valves with linear moving valve stem



www.google.com/patents/WO2003038326A1?cl=en
App. - Filed Oct 31, 2002 - Published May 8, 2003 - Leon Kerger - Leon Kerger
2 The valve position visual indicator as set forth in claim 1, wherein said sleeve means .... U.S. No. Patent 2,485,942 discloses an indicator comprised of ... in order to enhance the visual contrast between sleeve 18 and the grommet 24. ... annular sleeve 18 is projects downward to cover colored grommet 24 ...
Overview · Related · Discuss

Amazon Ex. 1002.0352

Aurally and **visually guided visual** search in a virtual environment

P Flanagan, KI McAnally, RL Martin... - Human Factors: The ..., 1998 - hfs.sagepub.com

... For the **visually** cued condi- tions, the arrow was presented simultaneously with the auditory cue. ... Figure 1. The **visual** out-of-FOV **indicator** (arrow) used to represent target location. ... The **visual** display used in the present study mapped the three dimensions of space into direction ...

Cited by 55 Related articles All 11 versions Cite Save

Endoscopic ultrasonography-**guided** interstitial implantation of iodine 125-seeds combined with chemotherapy in the treatment of unresectable pancreatic carcinoma: ...

Z Jin, Y Du, Z Li, Y Jiang, J Chen, Y Liu - Endoscopy, 2008 - thieme-connect.com

... With SPSS 13.0 software, quantitative **indicators** before and after the **operation** were compared using paired t ... 4 **Visual** analog scale (VAS) pain score of patients before and after brachytherapy. ... of the patients (54.5 %) had mild fever within a day of EUS-**guided operation** and that ...

Cited by 180 Related articles All 6 versions Cite Save

Analysis **guided visual** exploration of multivariate data

D Yang, EA Rundensteiner... - Visual Analytics Science ..., 2007 - ieeexplore.ieee.org

... Thus **visually** a nugget appears as a blue band across the axes, which represents the query ranges on ... Vis- iting time" is one factor [7] used as the main **indicator** of a ... handle different types of domains (dis- crete, continuous, nominal) and at best level capture the **visual** sim- ilarity ...

Cited by 61 Related articles All 15 versions Cite Save More

Managing performance **indicators** in **visual** art museums

A Zorloni - Museum management and curatorship, 2010 - Taylor & Francis

... museums. The second part will present the methodological and research issues that **guided** the data-gathering activities and the choice of the sample. In ... Figure 1). Managing performance **indicators** in **visual** art museums. All authors. ...

Cited by 21 Related articles Cite Save

Neural basis of the spontaneous optokinetic response produced by **visual** inversion.

RW Sperry - Journal of comparative and physiological psychology, 1950 - psycnet.apa.org

... about the neural apparatus involved, using the forced circling of eye rotation as an **indicator**. ... could be conceived as follows: With the eye rotated, any movement that is **visually** initiated or ... and which simulates exactly the circling produced by actual rotation of the **visual** field could ...

Cited by 1311 Related articles All 6 versions Cite Save

Validity-**guided** (re) clustering with applications to image segmentation

AM Bensaid, LO Hall, JC Bezdek... - ... on Fuzzy Systems, 1996 - ieeexplore.ieee.org

... that ps imposes on X a structure that is very similar to X's natural structure, as determined by **visual** inspection of X ... A flowchart of this validity-**guided** (re)clustering (VGC) algorithm is given in Fig. ... that CZl c Cz,Cz2 c C,,CZl U Cz2 = C, and C,, n C22 = 0. The **operation** referred to ...

Cited by 403 Related articles All 8 versions Cite Save

... Galaxies with Laser-**guided** Adaptive Optics: Evidence for Dispersion-dominated KinematicsBased on data obtained at the WM Keck Observatory, which is **operated** ...

DR Law, CC Steidel, DK Erb, JE Larkin... - The Astrophysical ..., 2007 - iopscience.iop.org

... OF HIGH-REDSHIFT STAR-FORMING GALAXIES WITH LASER-**GUIDED** ADAPTIVE OPTICS ... June data were obtained under exceptional photometric conditions with **visual**-band seeing ... angle, and possible merger- induced irregularities, rendering them unreliable **indicators** of ...

Cited by 136 Related articles All 16 versions Cite Save

Pancreatic Tissue Fluid Pressure in Chronic Pancreatitis Relation to Pain, Morphology, and Function

N Ebbehøj, L Borly, J Bülow, S Grønvall… - Scandinavian journal …, 1990 - Taylor & Francis

... In conclusion, pancreatic tissue fluid pressure is a valuable **indicator** of pain in ... Reference values, 127-943 kU/l From the interview **Visual** analogue scale (range ... suspected etiology, previous abdominal the needle technique via sonographically **guided operations**, diabetes, use ...

Cited by 109 Related articles All 7 versions Cite Save

A **visual** indication of environmental humidity using a color changing hologram recorded in a self-developing photopolymer

I Naydenova, R Jallapuram, V Toal… - Applied Physics …, 2008 - scitation.aip.org

... dependence on temperature, and fast response times are very promising for the design of humidity **indicators** provid- ing easy to interpret **visual** information. ... times can be controlled by the thickness of the photopolymer layer used to record the holographic humidity **indicator**. ...

Cited by 61 Related articles All 10 versions Cite Save

Respiration-correlated treatment delivery using feedback-**guided** breath hold: a technical study

C Nelson, G Starkschall, P Balter, MJ Fitzpatrick… - Medical …, 2005 - scitation.aip.org

... accelerator vault open to ensure no radiation would be delivered, but the **visual indicators** on the ... we observed that the gating delay box was working properly by **visually** observing the ... a phantom placed on the ir- regular breathing platform, we verified by **visual** observation of ...

Cited by 41 Related articles All 7 versions Cite Save

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Light guided assembly system



www.google.com/patents/CA2625348C?cl=en

Grant - Filed Oct 6, 2006 - Issued Mar 17, 2015 - Paul Ryznar - Ops Solutions Llc

The sensor apparatus (26) is operable to dete operation information and ... An operational guide system adapted to provide visual indicators to ...

Overview · Related · Discuss

Light guided assembly system and method



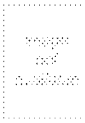
www.google.com/patents/EP2673592A1?cl=en

App. - Filed Feb 10, 2012 - Published Dec 18, 2013 - Paul Ryznar - OPS Solutions Llc

A guide system and method of projecting visual indicators onto a ... [0004] In addition to manufacturing assembly operations, numerous other ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/WO2012109593A1?cl=en

App. - Filed Feb 10, 2012 - Published Aug 16, 2012 - Paul Ryznar - OPS Solutions, LLC

A guide system and method of projecting visual indicators onto a ... the operation of an automated process, and wherein said input signal is ...

Overview · Related · Discuss

Visual guidance and verification for interconnecting nodes



www.google.com/patents/US20080104275

App. - Filed Oct 31, 2006 - Published May 1, 2008 - Jason Robert Almeida - Jason Robert Almeida

computer usable program code for operating a visual indicator .... ports and associated visual indicators for guided connection to a networked ...

Overview · Related · Discuss

Function indicator for visually indicating an operating state of ...



www.google.com/patents/EP1389786A1?cl=en

App. - Filed Aug 13, 2002 - Published Feb 18, 2004 - Volkan Yuksel - Vestel Elektronik Sanayi ve Ticaret A.S.

A function indicator for visually indicating an operating state of ... in order to guide the emitted light rays R towards the indicator surface 1 which ...

Overview · Related · Discuss

Light guided assembly system



www.google.com/patents/US7515981

Grant - Filed Oct 6, 2006 - Issued Apr 7, 2009 - Paul Ryznar - Ops Solutions Llc

The sensor apparatus (26) is operable to detect operation information ... An operational guide system adapted to provide visual indicators to an ...

Overview · Related · Discuss

Light guided assembly system and method



www.google.com/patents/US20130325155

App. - Filed Feb 10, 2012 - Published Dec 5, 2013 - Paul Ryznar - Ops Solutions Llc



A guide system and method of projecting visual indicators onto a physical ... In addition to manufacturing assembly operations, numerous other ...
Overview · Related · Discuss

Light guided assembly system



www.google.com/patents/WO2007044558A3?cl=en
App. - Filed Oct 6, 2006 - Published Jul 26, 2007 - Paul Ryznar - Ops Solutions Llc
... An operational guide system (10) adapted to provide visual indicators ... The sensor apparatus (26) is operable to dete operation information ...
Overview · Related · Discuss

Dental tools for guided surgery



www.google.com/patents/US9039413
Grant - Filed Dec 15, 2010 - Issued May 26, 2015 - Edmund Suter - Straumann Holding Ag
Surgical tool for use in guided surgery having a ... By providing tools with only visual depth indicators the flexibility available to the dentist or ...
Overview · Related · Discuss

Optical indicator for enclosed operating mechanism



www.google.com/patents/US3916133
Grant - Filed Apr 22, 1974 - Issued Oct 28, 1975 - Jr Parker A Bollinger - Allen Bradley Co
Oct. 28, 1975 OPTICAL INDICATOR FOR ENCLOSED OPERATING ... axially movable indicator for visual observation of an enclosed operating mechanism. ... a spring-return mechanism, guide slots and pins are required for this type of ...
Overview · Related · Discuss

Amazon Ex. 1002.0356

Notice of References Cited	Application/Control No. 13/984,744	Applicant(s)/Patent Under Reexamination RYZNAR ET AL.	
	Examiner Christopher E. Everett	Art Unit 2121	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-5,406,176 A	04-1995	Sugden; Walter H .	H05B37/029	315/292
*	B	US-2011/0178627 A1	07-2011	Wechter; David	G05B19/41875	700/109
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 09/28/2016

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER
EVERETT, CHRISTOPHER E

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
09/28/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Amazon Ex. 1002.0358

Office Action Summary	Application No. 13/984,744	Applicant(s) RYZNAR ET AL.	
	Examiner Christopher E. Everett	Art Unit 2121	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/28/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-25* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-25* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. The Office Action is responsive to the communication filed on 7/28/2016.

3. Claims 1-25 are pending.

Continued Examination Under 37 CFR 1.114

4. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/28/2016 has been entered.

Response to Amendment

5. The amendment, filed 7/28/2016, is fully responsive.

6. The claim objections to claims 1 and 15 have been corrected and the objections have been removed.

Response to Arguments

7. Applicant's arguments with respect to claims 1-25 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection. In particular, Applicant's arguments are directed to Ryznar not teaching or suggesting the claim amendments directed to independent claims 1 and 15. Dependent claims 2-14 and 16-25 depend, directly or indirectly, from independent claims 1 and 15, respectively. In the current rejection, Sugden and Wechter are utilized to teach the claim amendments.

Claim Rejections - 35 USC § 103

8. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-25 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2008/0121168 (Ryznar) in view of U.S. Patent No. 5,406,176 (Sugden) and further in view of U.S. Patent Publication No. 2011/0178627 (Wechter).

Claim 1:

Regarding claim 1, Ryznar describes a method of projecting visual indicators to guide actions of an individual for a particular guided operation, said method comprising: **(Rynar: "An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26) is operable to detect operation information and generate an output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively**

operable to project and target at least one indicating light in response to the at least one command signal from the controller (20).” abstract)

- providing a guide system having **(Ryznar: see the assembly guide system 10 as illustrated in figure 1 and as described in paragraph 0026)**
  - a guide system controller and **(Ryznar: see the control module 20 as illustrated in figure 2 and as described in paragraph 0030)**
  - a projector, **(Ryznar: see the directional light devices 22, 24 as illustrated in figure 2 and as described in paragraph 0032)**
- receiving a sequence of one or more input signals at said guide system controller, with the input signals being provided to said guide system controller by a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation: **(Ryznar: “As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. . . . Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station.” Paragraph 0031; “In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being**

communicated based on, at least in part, the first input signal 42." Paragraph 0032)

- selecting one or more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals. **(Ryznar: see the lights 22, 24 projecting on the designed work piece 14 and/or parts bin 34 locations as illustrated in figures 1, 2 and as described in paragraph 0032; "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module." Paragraph 0007; "Directional light device 22 is used to project indicating lights 46 at the component location 32, while the other directional light device 24 is used to project indicating lights 52 at operational step locations 54 on work piece 14. Each directional light device 22, 24 includes a light source 66 for projecting indicating lights 46, 52, with the directional light devices 22, 24 constructed**

such that the indicating lights 46, 52 may be selectively and movably positionable to direct the indicating light 46, 52 at pre-targeted locations." Paragraph 0032)

- projecting one or more visual indicators corresponding to said selected particular addressed display features onto one or more physical objects associated with the particular guided operation, with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals; **(Ryznar: see the changing of the sequence of indicating lights based on the input signals that a proper part was selected as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053)**

Ryznar does not explicitly describe addressed display features as described below. However, Sugden teaches the addressed display features as described below.

- said guide system controller including a plurality of selectable addressed display features with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system

controller: (Sugden: "Each automated lamp unit 12 has a unique protocol address so that each individual automated lamp unit 12 responds to only the downloading of data which is addressed specifically to it." Col. 5, lines 26-30; "In operation, system 10 can instruct automated lamp units 12 to adjust their parameters to a specified internally stored cue and the addressable electronic dimmers to a specific internally stored cue to adjust for intensity of a fixed lighting instrument or the on/off operation of other equipment." Col. 5, lines 33-38; "The intended automated lamp unit 12 reads the address of the data and accepts the downloaded data into its RAM memory, its processor reads the data file and effects adjustments of its lamp parameters, according to the proprietary operating program read from the lamp unit's EPROM memory 304." Col. 6, lines 18-24)

- wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature: and (see the input signals to display selection in Ryznar and the control of displays based on addresses in Sugden; Sugden: "In operation, system 10 can instruct automated lamp units 12 to adjust their parameters to a specified internally stored cue and the addressable electronic dimmers to a specific internally stored cue to adjust for intensity of a fixed lighting instrument or the on/off operation of other equipment." Col. 5, lines 33-38; Ryznar: "In

> response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42." Paragraph 0032)

One of ordinary skill in the art would have recognized that applying the known technique of Ryznar, namely, a light guided assembly system, with the known techniques of Sugden, namely, a light control system, would have yielded predictable results and resulted in an improved system. Accordingly, applying the teachings of Ryznar to provide control of lighting to guide actions with the teachings of Sugden to used addresses for the lighting to control the lighting would have been recognized by those of ordinary skill in the art as resulting in an improved light projection system (i.e., using addresses to determine which lights based on input signals of Ryznar based on the teachings of using addresses for lighting control in Sugden).

Ryznar and Sugden do not explicitly describe any sequence of input signals for dynamic control as described below. However, Wechter teaches the any sequence of input signals for dynamic control as described below.

- wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on

said input signals corresponding to desired visual indicators for the particular operation. (see the input signals to display selection in Ryznar and the dynamic control in Wechter; Wechter: see the reading of tags 118 (i.e., input signals), the retrieval of product configurations with display information (i.e., display features) based on the current processing configuration (i.e., dynamically), and the display of instructions 126 (i.e., projection of visual indicators) as illustrated in figure 7 and as described in paragraphs 0033, 0034, 0044; "As noted above, a wide range of products and product configurations may be accommodated in a single assembly line, and specific instructions, parameters, components, assembly steps, and so forth may be accessed for specific products." Paragraph 0033; "Moreover, specific instructions may be provided along with illustrations of how the assembly is to proceed. As also noted above, these may be stored in one or more databases and retrieved based upon the product information, the product configuration information, and the workstation information so as to appropriately lead the operator at the multiple workstations through the desired manufacturing steps." Paragraph 0034; Ryznar: "In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42." Paragraph 0032)

One of ordinary skill in the art would have recognized that applying the known technique of Ryznar, namely, a light guided assembly system, and the known techniques of Sugden, namely, a light control system, with the known techniques of Wechter, namely, displaying manufacturing steps on displays, would have yielded predictable results and resulted in an improved system. Accordingly, applying the teachings of Ryznar to provide control of lighting to guide actions and the teachings of Sugden to used addresses for the lighting to control the lighting with the teachings of Wechter to control the display of information based on the product line configuration and products would have been recognized by those of ordinary skill in the art as resulting in an improved light projection system (i.e., using addresses and various product types to determine which lights based on input signals of Ryznar based on the teachings of using addresses for lighting control in Sugden and using product information to control the display of information in Wechter).

Regarding **claim 2**, Ryznar discloses wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further comprises projecting visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers. – *interpreted as- the ability of the assembly guide system to recognize the relative position of a part present at a work station and provide notification to an operator* **(Ryznar: see each command signal 44a, 44b, 44c, 50a, 50b, 50c that correspond to the lights 46a, 46b, 46c, 52a, 52b, 52c based on the needed parts and their positions (i.e., positional identifiers) as**

illustrated in figure 2 and as described in paragraph 0053; "Control module 20 is illustrated as transmitting command signal 44a to directional light device 22, which in response to command signal 44a, projects indicating light 46a on storage location 70a of parts bin 34. Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053; "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable

in environments involving, for example, significant employee turnover and/or language and literacy barriers." Paragraph 0015)

Regarding **claims 3 and 16**, Ryznar discloses

- wherein the separate computer system or controller comprises a manufacturing execution system, and (Ryznar: "As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. . . . Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station." Paragraph 0031)
- wherein said guide system controller is interfaced with said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system. *–interpreted as-operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation and monitor cycle times of the individual operational steps and combined operations undertaken at the work station* (**Ryznar: see the sensor apparatus 26 and confirmation module 28 and parts bin 34 that are separate from the control module 20 as illustrated in figure 2; "An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor." Paragraph 0009;**

"The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers." Paragraph 0015)

Regarding **claim 4**, Ryznar discloses wherein said manufacturing execution system receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said manufacturing execution system from said

sensor apparatus.-*interpreted as- assembly guide system is operable, in response to an operation information or characteristic or identification information associated with work piece detected by sensor apparatus* **(Ryznar: see the input signals 48a, 48b, 48c, 56, 42 to the control module 20 as illustrated in figures 1, 2 and as described in paragraph 0025; "Assembly guide system 10 is operable, in response to an operation information or characteristic or identification information associated with work piece 14 detected by sensor apparatus 26, to selectively provide indicating lights 46, 52 to guide an operator in the selection and/or assembly of parts to work piece 14, with the indicating lights 46, 52 being directed and/or provided based on, at least in part, the operation information detected by sensor apparatus 26. The system 10 is also or alternatively operable in response to one or more confirmation signals, such as confirmation signals 48, 56, and/or 84 of FIG. 2 that are described below, which may be manually or automatically supplied to control module 20 to verify completion of a particular operation or task. The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step." para. 0024)**

Claims 5 and 17:

Ryznar and Sugden do not explicitly describe a system controller as described below. However, Wechter teaches the system controller as described below.

Regarding claims 5 and 17, Ryznar and Wechter disclose wherein the separate computer system or controller comprises a system controller that control the operation of an automated

process, and wherein said guide system controller is interfaced with said system controller, and wherein said input signals are provided to said guide system controller from said system controller. (see the control module 20 in communication with the network computer system in Ryznar and the system controller 30 of Wechter; Ryznar: "As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. . . . Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station." Paragraph 0031; Wechter: "In the illustrated embodiment, the control system includes a system controller 30 that is linked to individual controllers 32 which may be workstation controllers, tool controllers, and so forth. The system controller 30 may be further linked to various remote monitoring and control systems, such as for downloading from a remote location manufacturing programs, component parameters, orders for products, and so forth, and for uploading to a remote location information relating to the manufactured products, their process through the system, success or failure of various processes and tests, and so forth. The remote connections may be based upon any suitable protocol, such as existing industrial data exchange protocols, Internet protocols, and so forth." Paragraph 0021)

Ryznar, Sugden, and Wechter are combinable for the same rationale as set forth above with respect to claim 1.

Regarding **claims 6 and 18**, Ryznar discloses wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus. – *interpreted as- an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information* **(Ryznar: see the input signals 48a, 48b, 48c, 56, 42 to the control module 20 as illustrated in figures 1, 2 and as described in paragraph 0025; para.0007 of Ryznar, "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module.")**

Regarding **claims 7 and 19**, Ryznar discloses wherein said system controller comprises a programmable logic controller. *–interpreted as- controller being programmable via at least one program screen displayable on a display device* **(para.0011 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one**

directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The controller being programmable via at least one program screen displayable on a display device, the at least one program screen including at least one input field for entering and/or selecting indicia regarding sequential actions. The controller being further adapted to display at least one display screen on the display device during operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed.")

Regarding **claims 8 and 20**, Ryznar discloses wherein said system controller is interfaced with a manufacturing execution system. *–interpreted as- operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to**

monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.")

Regarding **claim 9**, Ryznar discloses wherein said visual indicators comprise at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image. *–interpreted as- information displayed includes a listing of sequential actions, animation and/or videos, part drawings* **(para.0012 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide sequential actions comprises, a controller, at least one display device, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response to the first input signal with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The at least one display device being operable to display information regarding the sequential actions. The information displayed by the display device may include, for example, descriptive text regarding the sequential actions, a listing of sequential actions, animation and/or videos, part drawings. The display device may be configured as a touch**

screen to enable an operator to interact with the operational guide system via the touch screen.")

Regarding **claim 10**, Ryznar discloses providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on one or more of said visual indicators. *–interpreted as- one confirmation signal indicative of a completion of an assembly action* **(para.0009 of Ryznar, "The controller may be adapted to receive at least one confirmation signal indicative of a completion of an assembly action, the at least one confirmation signal being either a manually input signal and an automated input signal. A manual input signal may be transmitted by an operator in response to completion of an assembly action by the operator selectively actuating a foot pedal and a push button. An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor.")**

Regarding **claim 11**, Ryznar discloses providing a sensor apparatus, wherein said -sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal. *–interpreted as- at least one confirmation signal indicative of a completion of an assembly action and automated input signal may be transmitted by a confirmation sensor* **(para.0009 of Ryznar, "The controller may be adapted to receive at least one confirmation signal indicative of a completion of an assembly action, the at least one confirmation signal being either a manually input signal and an automated input signal. A manual input signal may be transmitted by an operator in response to completion**

of an assembly action by the operator selectively actuating a foot pedal and a push button. An automated input signal may be transmitted by a machine vision system, a light curtain, or a confirmation sensor.")

Regarding **claim 12**, Ryznar discloses wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.*-interpreted as- use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece* **(para.0004 of Ryznar, "Several methods of preventing the improper assembly of a work piece exist. One such method is the use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece. Automated machine vision systems, however, are expensive and are highly customized such that they are only able to handle a limited assortment of work pieces. Other types of systems may involve human inspection of work piece products. Such systems inherently involve human error such that a higher degree of nonconforming parts may go undetected. Furthermore, when human inspection systems are constructed as separate "inspection stations" apart from the value added work operations, manufacturing costs are increased by allowing nonconforming work pieces to leave work stations.")**

Regarding **claim 13**, Ryznar discloses recording the time duration while an operator is guided by said guide system. *-interpreted as- monitor cycle times of the individual operational*

steps and combined operations undertaken at the work station **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers.")**

Regarding **claim 14**, Ryznar discloses displaying a recorded image and recorded time duration on a display device. *–interpreted as- operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed* **(para.0011 of Ryznar, "According to another aspect of the present invention, an operational guide system adapted to provide visual indicators to an individual to guide**

sequential actions comprises, a controller, at least one directional light device, and a controller. The controller adapted to selectively providing at least one command signal in response with the at least one directional light device being selectively operable to project and target at least one indicating light in response to the at least one command signal from the controller. The controller being programmable via at least one program screen displayable on a display device, the at least one program screen including at least one input field for entering and/or selecting indicia regarding sequential actions. The controller being further adapted to display at least one display screen on the display device during operation of the operational guide system, with the display screen being adapted to display indicia regarding sequential actions to be performed.")

Claim 15:

Regarding claim 15, Ryznar describes a guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising: **(Rynar: "An operational guide system (10) adapted to provide visual indicators to an individual to guide sequential actions includes at least one sensor apparatus (26), a controller (20), and at least one directional light device (22, 24). The sensor apparatus (26) is operable to detect operation information and generate an output indicative of the sensed operation information. The controller (20) receives at least a first input signal indicative of the operation information and selectively provides at least one command signal in response to the first input signal. The at least one directional light device (22, 24) being selectively operable to project and target at least one**

indicating light in response to the at least one command signal from the controller (20)." abstract)

- at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light; **(Ryznar: see the lights 22, 24 projecting on the designed work piece 14 and/or parts bin 34 locations as illustrated in figures 1, 2 and as described in paragraph 0032; "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module." Paragraph 0007; "Directional light device 22 is used to project indicating lights 46 at the component location 32, while the other directional light device 24 is used to project indicating lights 52 at operational step locations 54 on work piece 14. Each directional light device 22, 24 includes a light source 66 for projecting indicating lights 46, 52, with the directional light devices 22, 24 constructed such that the indicating lights 46, 52 may be**

selectively and movably positionable to direct the indicating light 46, 52 at pre-targeted locations." Paragraph 0032)

- a guide system controller, (Ryznar: see the control module 20 as illustrated in figure 2 and as described in paragraph 0030)
    - said guide system controller configured to receive a sequence of one or more input signals from a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation, (Ryznar: "As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. . . . Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station." Paragraph 0031; "In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42." Paragraph 0032)
    - wherein said guide system controller is configured to select one or more particular addressed display features from the plurality of addressed display features based on the input signals, and **(Ryznar: see the lights 22, 24 projecting on the**

designed work piece 14 and/or parts bin 34 locations as illustrated in figures 1, 2 and as described in paragraph 0032; "The present invention provides an operational guide system or assembly guide system adapted to provide visual indicators to an individual to guide sequential actions at a work location. According to one aspect of the present invention, an operational guide system comprises at least one sensor apparatus operable to detect operation information and generate an output indicative of the operation information, a controller receiving at least a first input signal indicative of the operation information and selectively providing at least one command signal in response to the first input signal, and at least one directional light device selectively operable to project and target at least one indicating light in response to the at least one command signal from the control module." Paragraph 0007; "Directional light device 22 is used to project indicating lights 46 at the component location 32, while the other directional light device 24 is used to project indicating lights 52 at operational step locations 54 on work piece 14. Each directional light device 22, 24 includes a light source 66 for projecting indicating lights 46, 52, with the directional light devices 22, 24 constructed such that the indicating lights 46, 52 may be selectively and movably positionable to direct the indicating light 46, 52 at pre-targeted locations." Paragraph 0032)

- with said guide system controller causing said directional light device to project visual indicators corresponding to an addressed display feature onto one or more

physical objects at a location corresponding to a positional identifier based on said input signals, **(Ryznar: see the changing of the sequence of indicating lights based on the input signals that a proper part was selected as illustrated in figure 2 and as described in paragraph 0053; "Upon receiving confirmation signal 48a from detection device 72 signifying that the proper part was selected, control module 20 then terminates projection of indicating light 46a and transmits command signal 50a to directional light device 24 such that indicating light 52a is projected on operational step location 54a on work piece 14 to direct operator 12 as to the proper assembly point for the selected part." Paragraph 0053)**

Ryznar does not explicitly describe addressed display features as described below. However, Sugden teaches the addressed display features as described below.

- said guide system controller including a plurality of programmed selectable addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller; **(Sugden: "Each automated lamp unit 12 has a unique protocol address so that each individual automated lamp unit 12 responds to only the downloading of data which is addressed specifically to it." Col. 5, lines 26-30; "In operation, system 10 can instruct automated lamp units 12 to adjust their parameters to a specified internally stored cue and the addressable electronic dimmers to a**

specific internally stored cue to adjust for intensity of a fixed lighting instrument or the on/off operation of other equipment." Col. 5, lines 33-38; "The intended automated lamp unit 12 reads the address of the data and accepts the downloaded data into its RAM memory, its processor reads the data file and effects adjustments of its lamp parameters, according to the proprietary operating program read from the lamp unit's EPROM memory 304." Col. 6, lines 18-24)

- wherein the input signals control selection of said addressed display features based on the address identifier for the said addressed display feature, (see the input signals to display selection in Ryznar and the control of displays based on addresses in Sugden; Sugden: "In operation, system 10 can instruct automated lamp units 12 to adjust their parameters to a specified internally stored cue and the addressable electronic dimmers to a specific internally stored cue to adjust for intensity of a fixed lighting instrument or the on/off operation of other equipment." Col. 5, lines 33-38; Ryznar: "In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42." Paragraph 0032)

Ryznar and Sugden are combinable for the same rationale as set forth above with respect to claim 1.

Ryznar and Sugden do not explicitly describe any sequence of input signals for dynamic control as described below. However, Wechter teaches the any sequence of input signals for dynamic control as described below.

- wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators. (see the input signals to display selection in Ryznar and the dynamic control in Wechter; Wechter: see the reading of tags 118 (i.e., input signals), the retrieval of product configurations with display information (i.e., display features) based on the current processing configuration (i.e., dynamically), and the display of instructions 126 (i.e., projection of visual indicators) as illustrated in figure 7 and as described in paragraphs 0033, 0034, 0044; "As noted above, a wide range of products and product configurations may be accommodated in a single assembly line, and specific instructions, parameters, components, assembly steps, and so forth may be accessed for specific products." Paragraph 0033; "Moreover, specific instructions may be provided along with illustrations of how the assembly is to proceed. As also noted above, these may be stored in one or more databases and retrieved based upon the product information, the product configuration information, and the workstation information so as to

appropriately lead the operator at the multiple workstations through the desired manufacturing steps." Paragraph 0034; Ryznar: "In response to the first input signal 42 received, the control module 20 outputs command signals 44, 50 to directional light devices 22, 24 along link 64 to provide visual indicators to the operator, as described in more detail below, with the command signals 44, 50 being communicated based on, at least in part, the first input signal 42." Paragraph 0032)

Ryznar, Sugden, and Wechter are combinable for the same rationale as set forth above with respect to claim 1.

Regarding **claim 21**, Ryznar discloses a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators. *-interpreted as- use of cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece* **(para.0004 of Ryznar, "Several methods of preventing the improper assembly of a work piece exist. One such method is the use of automated machine vision systems that utilize cameras to compare a work piece to the preprogrammed specification of a properly assembled work piece. Automated machine vision systems, however, are expensive and are highly customized such that they are only able to handle a limited assortment of work pieces. Other types of systems may involve human inspection of work piece products. Such systems inherently involve human error such that a higher degree of nonconforming parts may go undetected. Furthermore, when human inspection systems are constructed as**

separate "inspection stations" apart from the value added work operations, manufacturing costs are increased by allowing nonconforming work pieces to leave work stations.")

Regarding **claim 22**, Ryznar discloses wherein said guide system controller records images and time durations while an operator is guided by said guide system. *-interpreted as- provide and relay information to operator images of a work piece and monitor cycle times of the individual operational steps and combined operations undertaken at the work station* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover and/or language and literacy barriers."; para.0024 of Ryznar, "The system 10 is further**

operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.")

Regarding **claim 23**, Ryznar discloses q monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor. *-interpreted as-provide information to operator images of a work piece and monitor cycle times of the individual operational steps and combined operations undertaken at the work station* **(para.0015 of Ryznar, "The operational guide system of the present invention thus provides a cost effective and accurate method of guiding an individual through a series of tasks and provides confirmation that the tasks have been fully completed in the proper order. The operational guide system is useful in a wide array of applications, such as assembly, packaging, process preparation, and the like. Furthermore, the ability of the assembly guide system to recognize the presence, type, and/or relative position of a part present at a work station provides a flexible system that enables different types or models of parts to be processed at a particular work station, as well as provide notification to an operator of the presence of a work piece at the work station. The control module may also be used to monitor cycle times of the individual operational steps and combined operations undertaken at the work station, and to confirm that a proper part has been selected by an operator prior to proceeding to the next operational step. The operational guide system also provides an effective means of training individuals with regard to various activities, which is desirable in environments involving, for example, significant employee turnover**

and/or language and literacy barriers."; para.0024 of Ryznar, "The system 10 is further operable via display device 36 to provide and relay information to operator 12 such as, for example, a listing of steps needing completion, work instructions, images of a work piece, videos, and/or warnings regarding a missed or improperly performed assembly step.")

Claim 24:

Ryznar and Sugden do not explicitly describe a display feature input signal as described below. However, Wechter teaches the display feature input signal as described below.

Regarding claim 24, Ryznar and Wechter disclose the method of claim 1, further comprising receiving a display feature input signal at said guide system controller provided by said separate computer system or controller, said display feature input signal including information to be projected by said projector with said guide system controller operatively receiving said display feature input signal and controlling said projector to project a visual indicator including the information to be projected that is included in said display feature input signal. (see the system controller 30 of Wechter and the control module 20 in communication with the network computer system in Ryznar; Wechter: see the monitors 34 displaying information on the manufacturing process received from the system controller 30 as described in paragraphs 0022, 0034; "The control system is also designed to access product configurations, and instructional display screens corresponding to the configurations and to various manufacturing stages, and to serve the display screens to each workstation for viewing by the manufacturing operators. In the illustrated embodiment, the control system includes a system controller 30 that is linked to individual controllers 32 which may be workstation

controllers, tool controllers, and so forth. The system controller 30 may be further linked to various remote monitoring and control systems, such as for downloading from a remote location manufacturing programs, component parameters, orders for products, and so forth, and for uploading to a remote location information relating to the manufactured products, their process through the system, success or failure of various processes and tests, and so forth. The remote connections may be based upon any suitable protocol, such as existing industrial data exchange protocols, Internet protocols, and so forth." Paragraph 0021; Ryznar: "As previously indicated, control module 20 is adapted to receive a first input signal 42 regarding identification information of the work piece present at the work station. . . . Alternatively, however, a first input signal may be transmitted to a network computer system and, in response to the first input signal, the network system may provide the control module with the identification information regarding the work piece present at the work station." Paragraph 0031)

Ryznar, Sugden, and Wechter are combinable for the same rationale as set forth above with respect to claim 1.

Claim 25:

Ryznar and Sugden do not explicitly describe a display feature input signal as described below. However, Wechter teaches the display feature input signal as described below.

Regarding claim 25, Wechter discloses the method of claim 24, wherein the information to be projected included in said display feature input signal comprises at least one selected from the group consisting of numbers, words, alphanumeric characters and a drawing image. **(Wechter:**

see the display of various types of information as illustrated in figures 8, 9, 10, 11; "Such display screens may include certain product information, operator information, date, time, and other metadata or biographical information." Paragraph 0034; see the monitors 34 displaying information on the manufacturing process received from the system controller 30 as described in paragraphs 0022, 0034; "The control system is also designed to access product configurations, and instructional display screens corresponding to the configurations and to various manufacturing stages, and to serve the display screens to each workstation for viewing by the manufacturing operators. In the illustrated embodiment, the control system includes a system controller 30 that is linked to individual controllers 32 which may be workstation controllers, tool controllers, and so forth. The system controller 30 may be further linked to various remote monitoring and control systems, such as for downloading from a remote location manufacturing programs, component parameters, orders for products, and so forth, and for uploading to a remote location information relating to the manufactured products, their process through the system, success or failure of various processes and tests, and so forth. The remote connections may be based upon any suitable protocol, such as existing industrial data exchange protocols, Internet protocols, and so forth." Paragraph 0021)

Ryznar, Sugden, and Wechter are combinable for the same rationale as set forth above with respect to claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher E. Everett whose telephone number is (571)272-2851. The examiner can normally be reached on Monday through Friday from 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Lo can be reached on 571-272-9774. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Christopher E. Everett/
Primary Examiner, Art Unit 2121

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	Christopher E Everett	2121

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EAST	10-6-15	ATW
Search of PALM using inventor searches	4/25/2016	CEE
Search of EAST using inventors, assignee, and text searches	4/25/2016	CEE
Search of 700/95 using text searches	4/25/2016	CEE
Search of (G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001) using text searches	4/25/2016	CEE
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Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/984,744	RYZNAR ET AL.	
	Examiner	Art Unit	
	Christopher E. Everett	2121	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Christopher E. Everett*. (3)_____.

(2) *Karl T. Ondersma, Reg. No. 55,894*. (4)_____.

Date of Interview: *27 October 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *U.S. Patent Publication No. 2008/0121168 (Ryznar), U.S. Patent No. 5,406,176 (Sugden), U.S. Patent Publication No. 2011/0178627 (Wechter)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative, Karl Ondersma, and Examiner Christopher E. Everett discussed the technology within the patent application including the sequence of input signals and dynamic control. Applicant's representative and Examiner discussed the difference between the prior art and the technology. In particular, Applicant's representative and Examiner discussed how the prior art was directed to control based on an individual product selection (Wechter) and the technology can be programmed for dynamic control based on any sequence of input signals. Applicant's representative and Examiner discussed claim 1 with respect to the overview of the technology and the cited prior art (Ryznar, Sugden, and Wechter). No agreement was reached with respect to claim amendments. However, Examiner agreed to review proposed claim amendments before submission of the response to the Office Action.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/Christopher E. Everett/ Primary Examiner, Art Unit 2121	

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 11/18/2016

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER
EVERETT, CHRISTOPHER E

ART UNIT	PAPER NUMBER
2121	

NOTIFICATION DATE	DELIVERY MODE
11/18/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sytsma@glbf.com
patents@glbf.com
clark@glbf.com

Amazon Ex. 1002.0398

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/984,744	RYZNAR ET AL.	
	Examiner	Art Unit	
	Christopher E. Everett	2121	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Christopher E. Everett*. (3)_____.

(2) *Karl T. Ondersma, Reg. No. 55,984*. (4)_____.

Date of Interview: *14 November 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1 and 15*.

Identification of prior art discussed: *U.S. Patent Publication No. 2008/0121168 (Ryznar), U.S. Patent No. 5,406,176 (Sugden), and U.S. Patent Publication No. 2011/0178627 (Wechter)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative, Karl Ondersma, and Examiner Christopher E. Everett discussed the technology within the patent application including the combination of the sequence of input signals. Applicant's representative and Examiner discussed the proposed amendments to claims 1 and 15 (see attached) with respect to the technology and the cited prior art (Ryznar, Sugden, and Wechter). Examiner agreed that the proposed amendments to claims 1 and 15 would overcome the cited prior art (Ryznar, Sugden, and Wechter). Applicant's representative and Examiner discussed the need for additional consideration and/or search in view of the proposed amendments to claims 1 and 15.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☒ Attachment

/Christopher E. Everett/ Primary Examiner, Art Unit 2121	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Do Not Enter
/CEE/

Sr. No. 13/984,744 – Draft Claims – Do Not Enter

1. (currently amended) A method of projecting visual indicators to guide actions of an individual for a particular guided operation, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of selectable addressed display features with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;

receiving a sequence of one or more input signals at said guide system controller, with the input signals being provided to said guide system controller by a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation;

selecting one or more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals, wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature; and

projecting one or more visual indicators corresponding to said selected particular addressed display features onto one or more physical objects associated with the particular guided operation, with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals;

wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the particular operation with the combination of the sequence of input signals resulting in the creation of a dynamic, real time projection of visual indicators.

2. (previously presented) The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further comprises projecting visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers.

3. (previously presented) The method of claim 1, wherein the separate computer system or controller comprises a manufacturing execution system, and wherein said guide system controller is interfaced with said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

4. (previously presented) The method of claim 3, wherein said manufacturing execution system receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said manufacturing execution system from said sensor apparatus.

5. (previously presented) The method of claim 1, wherein the separate computer system or controller comprises a system controller that controls the operation of an automated process, and wherein said guide system controller is interfaced with said system controller, and wherein said input signals are provided to said guide system controller from said system controller.

6. (previously presented) The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. (original) The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. (original) The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. (previously presented) The method of claim 1, wherein said visual indicators comprise at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. (previously presented) The method of claim 1 further comprising providing a confirmation

signal to said guide system controller in response to completion of an action by an individual based on one or more of said visual indicators.

11. (original) The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. (previously presented) The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.

13. (original) The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. (original) The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. (currently amended) A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed selectable addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;

said guide system controller configured to receive a sequence of one or more input signals from a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation, wherein said guide system controller is configured to select one or more particular addressed display features from the plurality of addressed display features based on the input signals, and wherein the input signals control

selection of said addressed display features based on the address identifier for the said addressed display feature, with said guide system controller causing said directional light device to project visual indicators corresponding to an addressed display feature onto one or more physical objects at a location corresponding to a positional identifier based on said input signals, wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators with the combination of the sequence of input signals resulting in the creation of a dynamic, real time projection of visual indicators.

16. (previously presented) The guide system of claim 15, wherein the separate computer system or controller comprises a manufacturing execution system, and wherein said guide system controller is interfaced with said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

17. (previously presented) The guide system of claim 15, wherein the separate computer system or controller comprises a system controller that controls the operation of an automated process, and wherein said guide system controller is interfaced with said system controller, and wherein said input signals are provided to said guide system controller from said system controller.

18. (previously presented) The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

19. (original) The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. (original) The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. (previously presented) The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators.

22. (original) The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. (original) The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. (previously presented) The method of claim 1, further comprising receiving a display feature input signal at said guide system controller provided by said separate computer system or controller, said display feature input signal including information to be projected by said projector with said guide system controller operatively receiving said display feature input signal and controlling said projector to project a visual indicator including the information to be projected that is included in said display feature input signal.

25. (previously presented) The method of claim 24, wherein the information to be projected included in said display feature input signal comprises at least one selected from the group consisting of numbers, words, alphanumeric characters and a drawing image.

PATENT
RYZ01 P-101A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Confirmation No.	: 1049
Group Art Unit	: 2126
Examiner	: Christopher E. Everett
Applicant	: Paul Ryznar and James Ryznar
Serial No.	: 13/984,744
Filed	: August 9, 2013
For	: **LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD**
Customer No.	: 15671

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

RESPONSE

Responsive to the Office Action mailed September 28, 2016, Applicant wishes to amend the application as follows:

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 7 of this paper.

Remarks:

Applicants' undersigned representative thanks the Examiner for the courtesies extended during the telephonic interviews of October 27, 2016 and November 14, 2016. The remarks presented herein are believed to be fully responsive to the Office Action dated September 28, 2016, and to be in accordance with the telephonic interviews.

Claims 1-25 are pending in the application. Claims 1 and 15 have been amended as set forth above. The amendments are fully supported in the specification and drawings as originally filed. No new matter has been added.

CLAIM REJECTIONS:

Claims 1-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. Pub. No. 2008/0121168 A1 to Ryznar et al. ("Ryznar"), in view of U.S. Patent No. 5,406,176 ("Sugden") and further in view of U.S. Pub. No. 20110178627 ("Wechter"). Applicants respectfully traverse the rejections, however, in order to expedite prosecution, claims 1 and 15 have been amended as set forth above to further clarify the claimed method and system.

In the method of claim 1, the guide system controller is operative to receive any sequence of input signals from the separate computer system or controller, with amended claim 1 clarifying "with a combination of the sequence of input signals resulting in a creation of a dynamic, real time projection of visual indicators." This amendment is in accordance with the proposed amendments discussed during the telephonic interview of November 14, 2016, which Applicants understand from the Interview Summary dated November 18, 2016 overcome the rejection of claim 1 based on the cited prior art of Ryznar, Sugden and Wechter. As such, Applicants respectfully further submit that the rejections of claims 2-14 are likewise overcome.

Claim 15 has been amended in accordance with the amendments to claim 1 such that Applicants respectfully submit that the amendments to claim 15 overcome the rejection based on the cited prior art of Ryznar, Sugden and Wechter. Applicants further respectfully submit that the rejections of claims 16-23 are likewise overcome.

Claims 1-25 are pending in the application. Applicants respectfully submit that independent claims 1 and 15 are neither disclosed nor suggested by Ryznar, Sugden and Wechter, either alone or in combination with one another or any other reference of record, such that claims 1 and 15 are in condition for allowance, along with claims 2-14 and 16-25 depending therefrom.

The Examiner is invited to contact the undersigned at (616) 975-5500 should there be any questions or suggestions.

Respectfully submitted,

PAUL RYZNAR ET AL.

By: Gardner, Linn, Burkhart & Flory, LLP

Date: December 13, 2016

/Karl T. Ondersma/
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(616) 975-5500

KTO:lrv

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the present application:

1. (currently amended) A method of projecting visual indicators to guide actions of an individual for a particular guided operation, said method comprising:

providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of selectable addressed display features with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;

receiving a sequence of one or more input signals at said guide system controller, with the input signals being provided to said guide system controller by a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation;

selecting one or more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals, wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature; and

projecting one or more visual indicators corresponding to said selected particular addressed display features onto one or more physical objects associated with the particular guided operation, with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals;

wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the particular operation with a combination of the sequence of input signals resulting in a creation of a dynamic, real time projection of visual indicators.

2. (previously presented) The method of claim 1, wherein said guide system controller further includes a plurality of positional identifiers and said method further comprises selecting positional identifiers based on said input signals, and wherein said projecting visual indicators further comprises projecting visual indicators corresponding to said selected addressed display features onto a physical object at a location corresponding to said selected positional identifiers.

3. (previously presented) The method of claim 1, wherein the separate computer system or controller comprises a manufacturing execution system, and wherein said guide system controller is interfaced with said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

4. (previously presented) The method of claim 3, wherein said manufacturing execution system receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said manufacturing execution system from said sensor apparatus.

5. (previously presented) The method of claim 1, wherein the separate computer system or controller comprises a system controller that controls the operation of an automated process, and wherein said guide system controller is interfaced with said system controller, and wherein said input signals are provided to said guide system controller from said system controller.

6. (previously presented) The method of claim 5, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

7. (original) The method of claim 5, wherein said system controller comprises a programmable logic controller.

8. (original) The method of claim 5, wherein said system controller is interfaced with a manufacturing execution system.

9. (previously presented) The method of claim 1, wherein said visual indicators comprise at least one selected from the group consisting of numbers, words, alphanumeric characters, a drawing image and a video image.

10. (previously presented) The method of claim 1 further comprising providing a confirmation signal to said guide system controller in response to completion of an action by an individual based on one or more of said visual indicators.

11. (original) The method of claim 10 further comprising providing a sensor apparatus, wherein said sensor apparatus is operable to detect completion of the action and wherein said sensor apparatus generates said confirmation signal.

12. (previously presented) The method of claim 1 wherein said guide system further includes a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators, and wherein said method comprises recording images while an operator is guided by said guide system.

13. (original) The method of claim 12 further comprising recording the time duration while an operator is guided by said guide system.

14. (original) The method of claim 13 further comprising displaying a recorded image and recorded time duration on a display device.

15. (currently amended) A guide system adapted to provide visual indicators to an individual to guide actions, said guide system comprising:

at least one directional light device, said at least one directional light device being selectively operable to project and target at least one indicating light;

a guide system controller, said guide system controller including a plurality of programmed selectable addressed display features and a plurality of programmed positional identifiers with each said addressed display feature having a unique pre-programmed individual

address identifier within said guide system controller;

said guide system controller configured to receive a sequence of one or more input signals from a separate computer system or controller to cause said guide system to project visual indicators for a particular guided operation, wherein said guide system controller is configured to select one or more particular addressed display features from the plurality of addressed display features based on the input signals, and wherein the input signals control selection of said addressed display features based on the address identifier for the said addressed display feature, with said guide system controller causing said directional light device to project visual indicators corresponding to an addressed display feature onto one or more physical objects at a location corresponding to a positional identifier based on said input signals, wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically project any sequence of visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators with a combination of the sequence of input signals resulting in a creation of a dynamic, real time projection of visual indicators.

16. (previously presented) The guide system of claim 15, wherein the separate computer system or controller comprises a manufacturing execution system, and wherein said guide system controller is interfaced with said manufacturing execution system, and wherein said input signals are provided to said guide system controller from said manufacturing execution system.

17. (previously presented) The guide system of claim 15, wherein the separate computer system or controller comprises a system controller that controls the operation of an automated process, and wherein said guide system controller is interfaced with said system controller, and wherein said input signals are provided to said guide system controller from said system controller.

18. (previously presented) The guide system of claim 17, wherein said system controller receives signals from a sensor apparatus, and wherein said input signals are provided to said guide system controller based on said signals received by said system controller from said sensor apparatus.

19. (original) The guide system of claim 18, wherein said system controller comprises a programmable logic controller.

20. (original) The guide system of claim 19, wherein said system controller is interfaced with a manufacturing execution system.

21. (previously presented) The guide system of claim 15 further including a camera operable to image at least one of actions of an individual guided by said visual indicators and said visual indicators.

22. (original) The guide system of claim 21 wherein said guide system controller records images and time durations while an operator is guided by said guide system.

23. (original) The guide system of claim 22 further comprising a monitor interfaced with said guide system controller, and wherein recorded images and time durations are viewable on said monitor.

24. (previously presented) The method of claim 1, further comprising receiving a display feature input signal at said guide system controller provided by said separate computer system or controller, said display feature input signal including information to be projected by said projector with said guide system controller operatively receiving said display feature input signal and controlling said projector to project a visual indicator including the information to be projected that is included in said display feature input signal.

25. (previously presented) The method of claim 24, wherein the information to be projected included in said display feature input signal comprises at least one selected from the group consisting of numbers, words, alphanumeric characters and a drawing image.

Electronic Acknowledgement Receipt

EFS ID:	27777328
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma/Leslie Vredeveld
Filer Authorized By:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	13-DEC-2016
Filing Date:	09-AUG-2013
Time Stamp:	15:15:27
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$90
RAM confirmation Number	121416INTEFSW15170200
Deposit Account	505553
Authorized User	Karl Ondersma
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.19 (Document supply fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

37 CFR 1.492 (National application filing, search, and examination fees)

37 CFR 1.492(a) (Basic national fee only)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	01-Transmittal.pdf	264265 1ea74060feeced56966d8d0e5530a04f48d4f8d4	no	2
Warnings:					
Information:					
2	Amendment/Req. Reconsideration-After Non-Final Reject	02-RESPONSEC.pdf	41019 1c5a721f4f305f361cb19189680b3e9ff6fac484	no	8
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	03-IDS.pdf	612348 651260378ca2cefc115fa4995a4a72e8cf178dc6	no	4
Warnings:					
Information:					
4	Non Patent Literature	NPL01-AssembleyGuidance-laserguide.pdf	233381 bcf1436adae136f7c1dd0df8d8608dc2ee37ca0d	no	1
Warnings:					
Information:					
5	Non Patent Literature	NPL02-AssembleyGuidance-productivity.pdf	214640 8e0aeb16998e98d0ffe20ac76e7a5643511cd21f	no	1
Warnings:					
Information:					
6	Non Patent Literature	NPL03-AssemblyGuidance-AboutLaserProjection.pdf	292302 38ea0e031a736c67c05f3856a883d3b073164a0e	no	3
Warnings:					
Information:					

7	Fee Worksheet (SB06)	fee-info.pdf	30577 e5ba7dd423919059c91e295a32bada98c001d4ca	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	1688532

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	13984744
Filing Date:	09-Aug-2013
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Filer:	Karl T. Ondersma/Leslie Vredeveld
Attorney Docket Number:	RYZ01 P-101A

Filed as Small Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	90	90
		Total in USD ($)		**90**

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/984,744	Filing Date 08/09/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/13/2016	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 25	Minus	** 29	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
MINNIE JACKSON

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6000801		1999-12-14	Dillon et al.	
	2	6036319		2000-03-14	Rueb et al.	
	3	6170163	B1	2001-01-09	Bordignon et al.	
	4	6600476	B2	2003-07-29	Mathis et al.	
	5	7268893	B2	2007-09-11	Palmateer	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Assembly Guidance System Inc.'s LASERGUIDE brochure, publication date unknown.	
	2	Assembly Guidance System Inc.'s LASERGUIDE Productivity and Flexibility brochure, publication date unknown.	
	3	Assembly Guidance System Inc.'s About Laser Projection Webpage, indicated to have been published November 2004.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2016-12-13
Name/Print	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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Doc Code: TRAN.LET

Document Description: Transmittal Letter

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	13/984,744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar et al.
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

Total Number of Pages in This Submission: 2

ENCLOSURES (*Check all that apply*)

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☑ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Gardner, Linn, Burkhart & Flory, LLP		
Signature	/Karl T. Ondersma/		
Printed name	Karl T. Ondersma		
Date	December 13, 2016	Reg. No.	55894

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	/Leslie R. Vredeveld/		
Typed or printed name	Leslie R. Vredeveld	Date	December 13, 2016

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	14	("6000801" | "6036319" | "6170163" | "6600476" | "7268893").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:21
L2	4	(("RYZNAR") near3 ("Paul")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/06 14:22
L3	3	(("RYZNAR") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/01/06 14:22
L4	4	(ops adj2 solutions).as.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L5	5375	(G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001).cpc.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L6	1108	700/95.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L7	60369	(guide adj2 (system control controller))	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L8	78761	(project projector) adj5 (object work piece device)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L9	6395	L5 L6	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L10	50	L7 and L9	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L11	54	L8 and L9	US-	OR	ON	2017/01/06

			PGPUB; USPAT; FPRS; EPO			14:22
L12	101	L10 L11	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L13	504181	(guide visual indicator light projection) near4 (operator user)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L14	14080	(guide adj3 system).ab.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L15	202896	(pick place picking placing placement) adj4 (part component bin)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L16	12	L14 and L9	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L17	14194	L13 and L15	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L18	625	L17 and 700/$.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L19	50	L18 and L9	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L20	139	L2 L3 L4 L10 L11 L12 L16 L19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
L21	139	L20	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2017/01/06 14:22
S1	20	("4469553" | "20060106483" | "20070180674" | "5341183" | "6317980" | "7193696" | "7433796" | "7463368" | "20040111901" | "20060059699" | "20060185181" | "2682117" | "3600785" | "3623066" | "3667104" | "3986244" |	US-PGPUB; USPAT	OR	ON	2016/04/25 12:38

Amazon Ex. 1002.0427

		"4102568" | "4163309" | "4222036" | "7515981").PN.				
S2	1	("20080121168").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/04/25 12:40
S3	3	(("RYZNAR") near3 ("Paul")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/04/25 12:41
S4	3	(("RYZNAR") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/04/25 12:41
S5	1	("2013/0325155").URPN.	USPAT	OR	ON	2016/04/25 12:41
S6	4	(ops adj2 solutions).as.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S7	4	S4 S5	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S8	3	S2 S4	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S9	3	S3 S4	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:03
S10	4814	(G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001).cpc.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:57
S11	1106	700/95.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 13:57
S12	56653	(guide adj2 (system control controller))	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S13	72690	(project projector) adj5 (object work piece device)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S14	5833	S10 S11	US-PGPUB;	OR	ON	2016/04/25 14:00

Amazon Ex. 1002.0428

			USPAT; FPRS; EPO			
S15	572	S12 and S13	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S16	47	S12 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S17	52	S13 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S18	96	S16 S17	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:00
S19	464998	(guide visual indicator light projection) near4 (operator user)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
S20	47163	guide adj3 system	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
S21	127	S12 and S13 and S19	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:02
S22	12930	(guide adj3 system).ab.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S23	190143	(pick place picking placing placement) adj4 (part component bin)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S24	12	S22 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S25	12988	S19 and S23	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:03
S26	617	S25 and 700/$.ccls.	US-PGPUB;	OR	ON	2016/04/25 14:04

			USPAT; FPRS; EPO			
S27	48	S26 and S14	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/04/25 14:04
S28	2	("7515981").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/12 11:43
S29	28	("20030073541" | "2682117" | "3600785" | "3623066" | "3667104" | "3986244" | "4102568" | "4163309" | "4222036" | "4318222" | "4469553" | "4890382" | "5119536" | "5430662" | "5506641" | "5801946" | "5910894" | "6224385" | "6658218" | "7027886").PN. OR ("7515981").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/12 11:43
S30	10	("20050128437" | "20110179624" | "20110243380" | "20110314001" | "6600476" | "7515981" | "7530019" | "8027745" | "8162486" | "8199108").PN. OR ("9412053").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/12 11:45
S31	20	("20030163219" | "20040225390" | "20050058969" | "20060085088" | "4961148" | "5771043" | "6188402" | "6345207" | "6453209" | "6477437" | "6725184" | "6788987" | "6819965").PN. OR ("8027745").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/12 11:56
S32	1	("20110178627").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/12 13:53
S33	4	("7307542").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/15 10:00
S34	2	("5406176").PN.	US-PGPUB; USPAT; FPRS; EPO	OR	OFF	2016/08/15 10:06
S35	4	(("RYZNAR") near3 ("Paul")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/15 15:39
S36	3	(("RYZNAR") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/08/15 15:39
S37	4	(ops adj2 solutions).as.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39

S38	4683	(G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001).cpc.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S39	1106	700/95.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S40	57264	(guide adj2 (system control controller))	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S41	74554	(project projector) adj5 (object work piece device)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S42	5702	S38 S39	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S43	48	S40 and S42	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S44	53	S41 and S42	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S45	98	S43 S44	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S46	478537	(guide visual indicator light projection) near4 (operator user)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S47	12652	(guide adj3 system).ab.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S48	193361	(pick place picking placing placement) adj4 (part component bin)	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S49	11	S47 and S42	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39

Amazon Ex. 1002.0431

S50	13487	S46 and S48	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S51	625	S50 and 700/$.ccls.	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S52	50	S51 and S42	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39
S53	136	S35 S36 S37 S43 S44 S45 S49 S52	US-PGPUB; USPAT; FPRS; EPO	OR	ON	2016/08/15 15:39

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L22	0	(selecting one more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature projecting one more visual indicators corresponding to said selected particular addressed display features onto one more physical objects associated with the particular guided operation with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the particular operation with a combination of the sequence of input signals resulting in a creation of a dynamic real time projection of visual indicators).clm.	US-PGPUB; USPAT	AND	ON	2017/01/06 14:30
L23	0	(selecting one more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature projecting one more visual indicators corresponding to said selected particular addressed display features onto one more physical objects associated with the particular	US-PGPUB; USPAT	AND	ON	2017/01/06 14:30

		guided operation with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals wherein said guide system controller is operative).clm.				

1/6/2017 2:33:26 PM
C:\Users\ceverett\Documents\EAST\Workspaces\13984744.wsp

Amazon Ex. 1002.0433

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	CHRISTOPHER E EVERETT	2121

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	01/06/2017								
1	1	=								
2	2	=								
3	3	=								
4	4	=								
5	5	=								
6	6	=								
7	7	=								
8	8	=								
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24	22	=								
25	23	=								
15	24	=								
16	25	=								

Amazon Ex. 1002.0434

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	CHRISTOPHER E EVERETT	2121

CPC						
Symbol					**Type**	**Version**
G05B		19	/	418	F	2013-01-01
G05B		2219	/	32001	A	2013-01-01
G05B		2219	/	35494	A	2013-01-01
G05B		19	/	41805	I	2013-01-01
G05B		2219	/	31027	A	2013-01-01
G05B		2219	/	31046	A	2013-01-01
Y02P		90	/	04	A	2015-11-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/CHRISTOPHER E EVERETT/ Primary Examiner.Art Unit 2121	01/06/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3A

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	CHRISTOPHER E EVERETT	2121

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
		G	0	5	B	19 / 00 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/CHRISTOPHER E EVERETT/ Primary Examiner.Art Unit 2121	01/06/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3A

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	CHRISTOPHER E EVERETT	2121

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	19	17												
2	2	20	18												
3	3	21	19												
4	4	22	20												
5	5	23	21												
6	6	24	22												
7	7	25	23												
8	8	15	24												
9	9	16	25												
10	10														
11	11														
12	12														
13	13														
14	14														
17	15														
18	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 25	
/CHRISTOPHER E EVERETT/ Primary Examiner.Art Unit 2121 (Primary Examiner)	01/06/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3A

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Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6000801		1999-12-14	Dillon et al.	
	2	6036319		2000-03-14	Rueb et al.	
	3	6170163	B1	2001-01-09	Bordignon et al.	
	4	6600476	B2	2003-07-29	Mathis et al.	
	5	7268893	B2	2007-09-11	Palmateer	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Assembly Guidance System Inc.'s LASERGUIDE brochure, publication date unknown.	
	2	Assembly Guidance System Inc.'s LASERGUIDE Productivity and Flexibility brochure, publication date unknown.	
	3	Assembly Guidance System Inc.'s About Laser Projection Webpage, indicated to have been published November 2004.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/Christopher E. Everett/ (01/06/2017)	Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13984744
Filing Date	2013-08-09
First Named Inventor	Paul Ryznar
Art Unit	2121
Examiner Name	Christopher E. Everett
Attorney Docket Number	RYZ01 P-101A

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Karl T. Ondersma/	Date (YYYY-MM-DD)	2016-12-13
Name/Print	Karl T. Ondersma	Registration Number	55894

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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15671 7590 01/17/2017

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER
EVERETT, CHRISTOPHER E

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 01/17/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

TITLE OF INVENTION: LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	04/17/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

15671 7590 01/17/2017
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

TITLE OF INVENTION: LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	04/17/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
EVERETT, CHRISTOPHER E	2121	700-095000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
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NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

15671 7590 01/17/2017

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

EXAMINER	
EVERETT, CHRISTOPHER E	

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 01/17/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/984,744	Applicant(s) RYZNAR ET AL.	
	Examiner Christopher E. Everett	Art Unit 2121	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *12/13/2016*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-25*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 12/13/2016
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Christopher E. Everett/
Primary Examiner, Art Unit 2121

DETAILED ACTION

1. The Office Action is responsive to the communication filed on 12/13/2016.

2. The present application is being examined under the pre-AIA first to invent provisions.

3. Claims 1-25 are pending.

Allowable Subject Matter

4. Claims 1-25 are allowed.

5. The following is an examiner's statement of reasons for allowance:

Claims 1-14 and 24-25

Regarding claim 1, the prior art as described in the prosecution history describes:

A method of projecting visual indicators to guide actions of an individual for a particular guided operation, said method comprising:

- providing a guide system having a guide system controller and a projector, said guide system controller including a plurality of selectable addressed display features with each said addressed display feature having a unique pre-programmed individual address identifier within said guide system controller;
- receiving a sequence of one or more input signals at said guide system controller, with the input signals being provided to said guide system controller by a separate

computer system or controller to cause said guide system to project visual indicators for a particular guided operation;

However, regarding claim 1, the prior art as described in the prosecution history does not describe:

- selecting one or more particular addressed display features by said guide system controller from the plurality of said addressed display features based on said input signals, wherein said input signals control selection of said addressed display features based on the address identifier for the said addressed display feature; and
- projecting one or more visual indicators corresponding to said selected particular addressed display features onto one or more physical objects associated with the particular guided operation, with said guide system controller configured to control operation of said projector to project said visual indicators based on said input signals;
- wherein said guide system controller is operative to receive any sequence of input signals from the separate computer system or controller to dynamically control projection of any sequence of said visual indicators corresponding to respective said addressed display features based on said input signals corresponding to desired visual indicators for the particular operation with a combination of the sequence of input signals resulting in a creation of a dynamic, real time projection of visual indicators.

Dependent claims 2-14 and 24-25 depend from independent claim 1 and are allowable for the same reasons as described above.

Claims 15-23

Independent claim 15 is substantially similar to independent claim 1 and is allowable for the same reasons as outlined above with respect to claim 1. Dependent claims 16-23 depend from independent claim 15 and are allowable for the same reasons as described above.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher E. Everett whose telephone number is (571)272-2851. The examiner can normally be reached on Monday through Friday from 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Lo can be reached on 571-272-9774. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher E. Everett/
Primary Examiner, Art Unit 2121

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13984744	RYZNAR ET AL.
	Examiner	**Art Unit**
	Christopher E Everett	2121

CPC- SEARCHED		
Symbol	**Date**	**Examiner**
G05B19/02	10-6-15	ATW

CPC COMBINATION SETS - SEARCHED		
Symbol	**Date**	**Examiner**

US CLASSIFICATION SEARCHED			
Class	**Subclass**	**Date**	**Examiner**
700	95	10-6-15	ATW

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
EAST	10-6-15	ATW
Search of PALM using inventor searches	4/25/2016	CEE
Search of EAST using inventors, assignee, and text searches	4/25/2016	CEE
Search of 700/95 using text searches	4/25/2016	CEE
Search of (G05B19/418 or G05B19/41805 or Y02P90/04 or G05B2219/31046 or G05B2219/31027 or G05B2219/35494 or G05B2219/32001) using text searches	4/25/2016	CEE
Update of EAST and sub-class searches described above	8/15/2016	CEE
Search of Google patent using text searches	8/15/2016	CEE
Search of Google scholar using text searches	8/15/2016	CEE
Update of EAST and sub-class searches described above	1/6/2017	CEE

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	Search of USPAT and USPGPUB using text searches	1/6/2017	CEE

	/CHRISTOPHER E EVERETT/ Primary Examiner.Art Unit 2121

Electronic Acknowledgement Receipt

EFS ID:	28932825
Application Number:	13984744
International Application Number:	
Confirmation Number:	1049
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Customer Number:	15671
Filer:	Karl T. Ondersma/Leslie Vredeveld
Filer Authorized By:	Karl T. Ondersma
Attorney Docket Number:	RYZ01 P-101A
Receipt Date:	14-APR-2017
Filing Date:	09-AUG-2013
Time Stamp:	16:37:39
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$480
RAM confirmation Number	041717INTEFSW16385500
Deposit Account	505553
Authorized User	Karl Ondersma

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	PTO-85.pdf	111351 cc4c58927f912be949716d07ceb6ad9224d38790	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30552 2058024fe1dadbd6843035a88f0176cd94e0b432	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	141903		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	13984744
Filing Date:	09-Aug-2013
Title of Invention:	LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD
First Named Inventor/Applicant Name:	Paul Ryznar
Filer:	Karl T. Ondersma/Leslie Vredeveld
Attorney Docket Number:	RYZ01 P-101A

Filed as Small Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

15671 7590 01/17/2017
Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Leslie R. Vredeveld	(Depositor's name)
/Leslie R. Vredeveld/	(Signature)
April 14, 2017	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	08/09/2013	Paul Ryznar	RYZ01 P-101A	1049

TITLE OF INVENTION: LIGHT GUIDED ASSEMBLY SYSTEM AND METHOD

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	04/17/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
EVERETT, CHRISTOPHER E	2121	700-095000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
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☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 Gardner, Linn, Burkhart
3 & Flory, LLP

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: OPS Solutions LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Wixom, Michigan (US)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 505553 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
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NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Karl T. Ondersma/ Date April 14, 2017
Typed or printed name Karl T. Ondersma Registration No. 55894

Amazon Ex. 1002.0456

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/984,744	05/23/2017	9658614	RYZ01 P-101A	1049

15671 7590 05/03/2017

Gardner, Linn, Burkhart & Flory, LLP
2851 Charlevoix Dr., SE, Suite 207
Grand Rapids, MI 49546

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 433 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Paul Ryznar, Northville, MI;
James Ryznar, Belleville, MI;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT7273007

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	CONVERSION AND CHANGE OF NAME

CONVEYING PARTY DATA

Name	Execution Date
OPS SOLUTIONS LLC	06/29/2021

RECEIVING PARTY DATA

Name:	LIGHTGUIDE, INC.
Street Address:	48443 ALPHA DRIVE
Internal Address:	SUITE 175
City:	WIXOM
State/Country:	MICHIGAN
Postal Code:	48393

PROPERTY NUMBERS Total: 7

Property Type	Number
Patent Number:	7515981
Patent Number:	9658614
Patent Number:	9965897
Patent Number:	10528036
Patent Number:	10983500
Application Number:	17235556
Application Number:	17432778

CORRESPONDENCE DATA

Fax Number: (616)975-5505

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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Address Line 4: GRAND RAPIDS, MICHIGAN 49546

ATTORNEY DOCKET NUMBER:	RYZ01 A-122
NAME OF SUBMITTER:	KARL T. ONDERSMA
SIGNATURE:	/Karl T. Ondersma/

DATE SIGNED:	04/11/2022
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 4
source=certificateofconversion#page1.tif
source=certificateofconversion#page2.tif
source=certificateofconversion#page3.tif
source=DELAWARE-certificate#page1.tif

CSCL/CD-754 (Rev. 07/19)

MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
CORPORATIONS, SECURITIES & COMMERCIAL LICENSING BUREAU

Date Received
JUN 30 2021

(FOR BUREAU USE ONLY)

AC1

$525 MC CEPAS 21063051530229

This document is effective on the date filed, unless a subsequent effective date within 90 days after received date is stated in the document.

FILED

JUN 30 2021

ADMINISTRATOR
CORPORATIONS DIVISION

Name
Darren Bartlette

Address
Dentons US LLP 22 Little W 12th Street

City | State | ZIP Code
New York, NY 10014

Document will be returned to the name and address you enter above. If left blank, document will be returned to the registered office.

EFFECTIVE DATE:

Expiration date for new assumed names: December 31,

Expiration date for transferred assumed names appear on page 2.

CERTIFICATE OF CONVERSION
For use by a Limited Liability Company Converting into a Business Organization

Pursuant to the provisions of Act 284, Public Acts of 1972 (profit corporations), Act 162, Public Acts of 1982 (nonprofit corporation) and Act 23, Public Acts of 1993 (limited liability companies), the undersigned limited liability company executes the following Certificate of Conversion.

1. Before Conversion

Entity Name:	Entity ID
OPS Solutions LLC	801342542

Indicate (X) Entity Type	☒	Domestic Limited Liability Company
		Street Address, if different than the one provided in Item 3: 48443 Alpha Drive, Suite 175 Wixom, MI USA 48393
	☐	Foreign Limited Liability Company

2. After Conversion

Entity Name:
LightGuide, Inc.

Indicate (X) Entity Type	☐	Domestic Profit Corporation
	☐	Domestic Nonprofit Corporation
	☒	Foreign Profit Corporation
	☐	Foreign Nonprofit Corporation
	☐	Domestic Limited Liability Company
	☐	Foreign Limited Liability Company

If the converting limited liability company is a domestic limited liability company that has not commenced business, has not issued any membership interests; has no debts or other liabilities, and has not received or returned any payments for its membership interests, proceed to Item 4.

If the converting limited liability company is a domestic limited liablity company that has commenced business or a foreign limited liability company, proceed to Item 3.

DocuSign Envelope ID: D44C2D4B-B182-4AD2-8F91-568A82BF8DA3

3. Surviving Business Organization (After Conversion Entity)

Governing Statute: Delaware Corporation Act
Street Address: 48443 Alpha Drive, Suite 175 Wixom, MI USA 48393
Principal Place of Business: 48443 Alpha Drive, Suite 175 Wixom, MI USA 48393

4. (Complete only if a later effective date is desired other than the date of filing. The date must be no more than 90 days after the receipt of this document by the administrator.)

The conversion is effective on the _____ day of _____ , _____ .

The plan of conversion will be furnished by the surviving business organization, on request and without cost, to any member of the converting limited liability company.

The conversion is permitted by the law that will govern the internal affairs of the business organization after conversion and the surviving business organization complies with that law in converting.

5. The assumed names being transferred to continue for the remaining effective period of the Certificate of Assumed Name on file prior to the conversion are:

Assumed Name	Expiration Date

6. The converting limited liability company's name and/or assumed name(s) to be used as new assumed name(s) of the surviving business organization:

Assumed Name

7. **Signatures**: Complete only Section (a) or (b) if the converting entity is a domestic limited liability company. Proceed to Item 8 if the before conversion entity is a foreign limited liability company.

Complete if the domestic limited liability company has not commenced business:

a) The domestic limited liability company has not yet commenced business, has not issued any membership interests; has no debts or other liabilities, and has not received or returned any payments for its membership interests and the plan of conversion was adopted and approved by unanimous consent of the organizers, in accordance with Section 708(1)(d) of the Act.

Signed this_____ day of _____, _____.

(Signature of Organizer)	(Signature of Organizer)
(Type or Print Name)	(Type or Print Name)
(Signature of Organizer)	(Signature of Organizer)
(Type or Print Name)	(Type or Print Name)

Complete if the domestic limited liability company has commenced business:

b) The plan of conversion was adopted and approved by the unanimous vote of the members, entitled to vote, unless the articles of organization or operating agreement provide otherwise, in accordance with Section 708(1)(c) of the Act.

Signed this 29th day of June, 2021.

By DocuSigned by: Paul Ryznar 64C4C22B53B2D4D8...
(Signature of Member, Manager or Authorized Agent)

Paul Ryznar
(Type or Print Name)

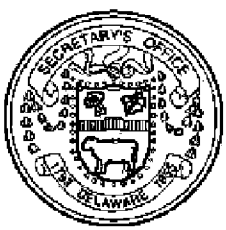
Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "LIGHTGUIDE, INC." IS DULY INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL CORPORATE EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE THIRTIETH DAY OF JUNE, A.D. 2021.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "LIGHTGUIDE, INC." WAS INCORPORATED ON THE TWENTY-NINTH DAY OF JUNE, A.D. 2021.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL FRANCHISE TAXES HAVE BEEN ASSESSED TO DATE.





6042134 8300

SR# 20212589666

Authentication: 203569796

Date: 06-30-21

You may verify this certificate online at corp.delaware.gov/authver.shtml