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Automatic Agricultural Skilling

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ABSTRACT

Our invention Automatic Agricultural Skilling is an automated management of irrigating or spraying or sprinkling devices includes electrical sensors that area unit severally conscious of temperature, close lighting and actual wet content of the soil. The output of those sensors is compared to predetermined reference standards and also the ensuing signals accustomed management the applying of water to the soil or plants or trees. The invention provides an extremely machine-controlled agricultural production system that includes, as essential components sensing scheme comprising direct and indirect sensing means that in an agricultural production space. The direct sensing means that area unit usually ground or plant mounted. The indirect sensing means that area unit remote from the world being detected. The direct and indirect sensing means that area unit custom-made to put together generate information on all necessary parameters within the uniform agricultural production area.

Keywords: Automatic, Agricultural, Irrigating or Spraying, Sprinkling, Accustomed, Accustomed, Detected.

BACKGROUND OF THE INVENTION

All strictly mechanical approaches to issues in agriculture like vinery or plantation pruning and harvest home, ground crop harvest home or weeding suffer from the lack of mechanical strategies to simply adapt to variant conditions while not human operator intervention. Vineyards square measure able to harvest by mechanical strategies, and lots of do.However, mechanical strategies aren't sensible for harvest home of grapes in intact clusters. To date, pruning, harvest home of intact clusters, suckering and fastening of vineyards is practiced manually nearly while not exception. this is often extraordinarily pricey for vineyards since it's terribly labor intensive.

The effortful nature of this sort of farming conjointly puts the farmers in danger from union activity. Similar issues pertain to fruit orchards, that share the same business model.In alternative things, as an example in organic farming, weeds should be removed while not use of herbicides. This again, leads to the farmer creating use of an oversized quantity of costly labor.Organic farming conjointly suffers issues from insect pests that may, in some cases be controlled throughout important elements of their life cycle by removal of leaves, and affected material.

These varieties of tasks will ne'er be accomplished by strictly mechanical means that as a result of strictly mechanical strategies aren't able to showing intelligence reply to their atmosphere on a

selective on the far side a really easy level of quality. additionally, farming generally is receiving larger and larger pressure to reduce use of chemical strategies attributable to environmental problems.

There are devices, like that of Slaughter and Lamm at UC Davis in 2000 for machine vision primarily based weed management, that haven't been proprietary. (Found by a thesis search.) However, their system failed to management an automaton arm, however merely controlled a sprayer, that needed precise temporal arrangement of the motion of the device because it was dragged behind a tractor.Nor did this technique perform any however the foremost rudimentary machine vision operations. They failed to decide to create use of quite one modality for sensing, nor did they think about any of the opposite parts that create this invention distinctive like intelligent integration of the operator or semi-autonomous restricted self-steering throughout its primary duty execution.

There square measure alternative devices, that are noted for a substantial amount in industrial automation, that couple automaton arms with machine vision for playacting tasks, even with a high degree of property, and versatile automaton systems that square measure trainable and simply programmable.However, these aren't mobile machines, they're unable to rove around or be steered by AN operator. Nor do they incorporate a communications system that permits the expertise of every machine to be collated therefore on improve the performance of all. Nor, as so much as will be determined, have any of those environmentally responsive robotic techniques are applied to agriculture up to now.

There square measure alternative innovations, like the utilization of multiple detector modalities (i.e., combining machine vision with information to provide a much better three-dimensional mapping of an object) that aren't generally utilized in trade, however which might be necessary in field applications to provide a sturdy system.Another innovation is that the use of GPS incorporated into the automaton arms themselves as the simplest way of trailing the motion of the robot's arms.

This is a system integration invention, that brings along in a very new manner element that square measure out there and used nowadays in varied settings, largely industrial facilities of assorted sorts. Additionally, to up the labor state of affairs, it leads to new capacities that aren't out there currently, like elaborate mapping of croplands traversed. consequently, this invention is novel and not obvious at intervals the sector of agriculture.

Some aspects of this invention, like the utilization of GPS to trace motion of automaton arms square measure novel at intervals the sector of artificial intelligence.Another novel facet of this invention at intervals the sector of artificial intelligence is that the use of a communications system connected to the manufacturer or manufacturer's agent which might be accustomed collect sensing, call and error data in order that alternative robots will create use of the solutions created for one to learn all.

Current systems for trade, wherever they need such communications, use them for maintenance and medical specialty functions. A probable reason why this facet of the invention would occur for agriculture initial is that robots sold-out for industrial functions square measure sold-out to wide varied competitors. United Nations agency use them to execute proprietary styles and trade secrets, consequently, such a feature wouldn't be accepted. Agriculture is structured otherwise.

OBJECTIVES

1. The objective of the invention is to provide a highly automated agricultural production system (hereafter the agricultural system).

2. The other objective of the invention is to provide a agricultural system in which both direct and indirect sensing means are utilized to generate maximum data in an economical manner from an agricultural area.

3. The other objective of the invention is to provide a agricultural system which is in large part computer controlled.

4. The other objective of the invention is to provide a agricultural system wherein direct and indirect sensing means are linked to computing means in a pattern of many feedback loops.

5. The other objective of the invention is to provide a agricultural system wherein in a preferred embodiment water is utilized to power various devices, under the control of computing means.

6. The other objective of the invention is to provide a produce associate agricultural system whereby liquid and/or gas may be used to derive power for playacting varied field operation functions like gathering, conveying, grading and storing.

7. The other objective of the invention is to provide a extra object is to scale back consumption of fuel by a lot of economical accomplishment of all required functions, to utilize all organic wastes in energy production, and to use any energy supply obtainable on a farm, as well as water, sun and wind.

8. The other objective of the invention is to provide a scale back soil, water and pollution by minimizing the employment of water and unhealthful chemicals and eliminating the employment of gas or diesel engines in tractors and different implements. A corollary is to scale back the employment of all agricultural chemicals.

SUMMARY

The present invention provides an extremely machine-driven system for the assembly of agricultural product that contains, as essential components:

1. sensing suggests that comprising each direct and indirect sensing means;

2. information transmittal suggests that for forwarding information generated by the sensing suggests that to computing suggests that and for transmittal directions from the computing suggests that via applicable interfacing suggests that (controllers) to varied devices (field effectors) within the agricultural area;

3. computing suggests that coupled by method of aforementioned information transmittal suggests that to aforementioned sensing suggests that and to aforementioned field effectors during a pattern of the many feedback loops.

The computing suggests that is programmed to change correlation of information received from all direct and indirect sensing suggests that and to get applicable directions to accomplish a substantive variety of functions needed for the operation of the agricultural system;

4. fluid delivery suggests that. To utilize the complete potential of the agricultural system of this invention, additional most popular suggests that are: field operation suggests that which might embody any or all of the following:means to reap the agricultural product.

Themeans to convey the agricultural product far from the positioning of harvesting;means to grade the agricultural product;means to store the agricultural product (optional wherever the merchandise is directly sold), and suggests that to containerise the agricultural product.In an additional most popular embodiment of this invention suggests that are provided to impact plant care operations such pruning, thinning, brush removal and therefore the like.

The most extremely most popular embodiment of this invention makes most utilization of water received from the fluid delivery suggests that to perform one or a lot of the sector operations set forth on top of, most ideally, harvesting, conveying, grading that is conducted in water, storage that is conducted underneath water and plant care operations that are conducted utilizing power derived from the water flowing within the fluid delivery suggests that by method of 1 or a lot of water to mechanical torsion converters.

DIAGRAM

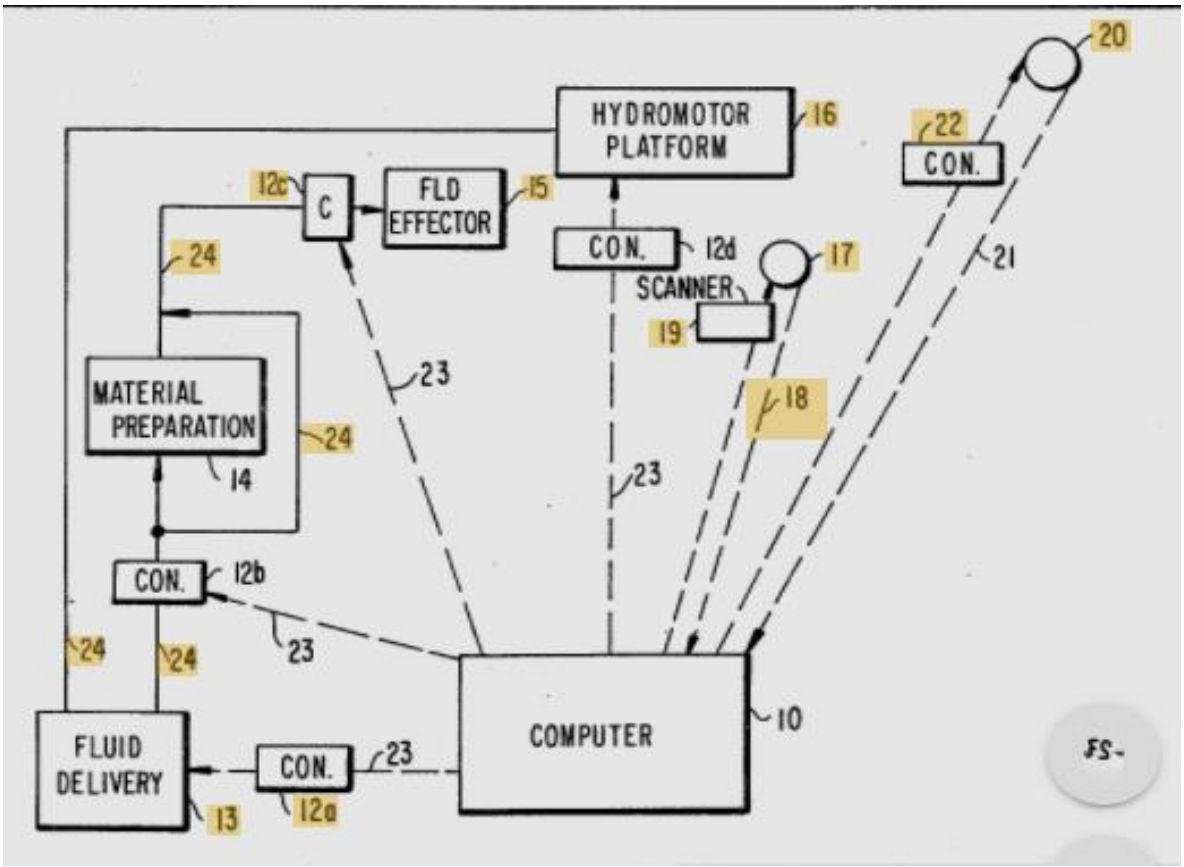

FIG. 1 may be a schematic illustration of the foremost parts of the agricultural system of this invention.

automatic agricultural skilling

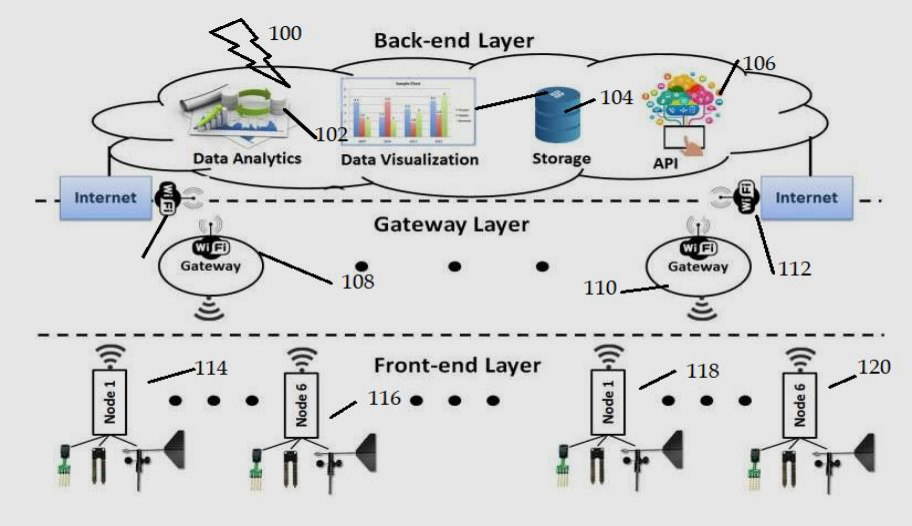

Fig.1: Automatic Agricultural Skilling Flow Chart.

FIG. 2 illustrates a carbon dioxide direct sensor.

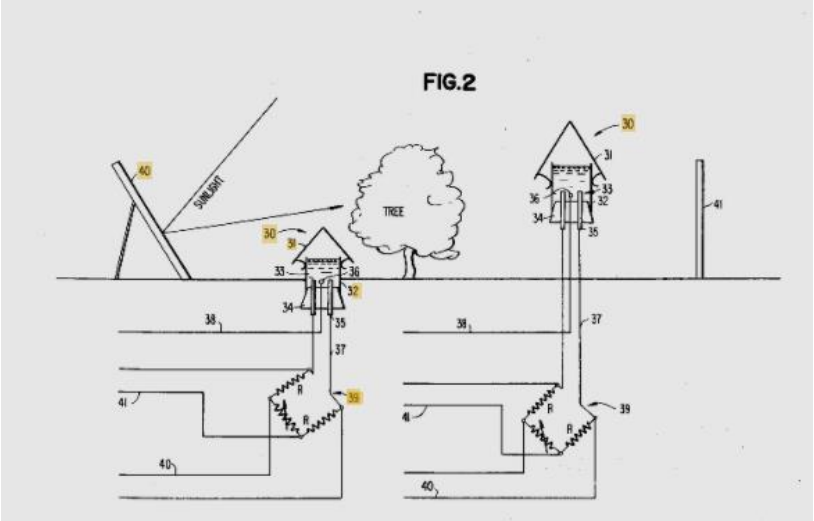

Fig.2: Automatic Agricultural Skilling Block Diagram

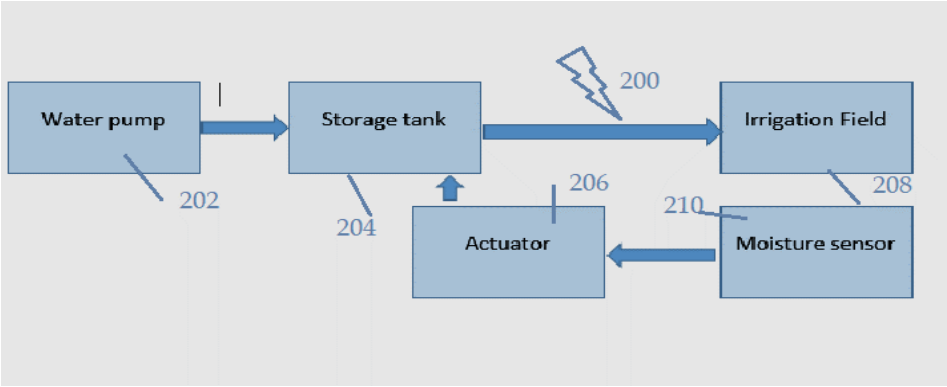

FIG. 3 shows indirect sensing means that with associate electronic sampling gate which might be used within the gift invention.

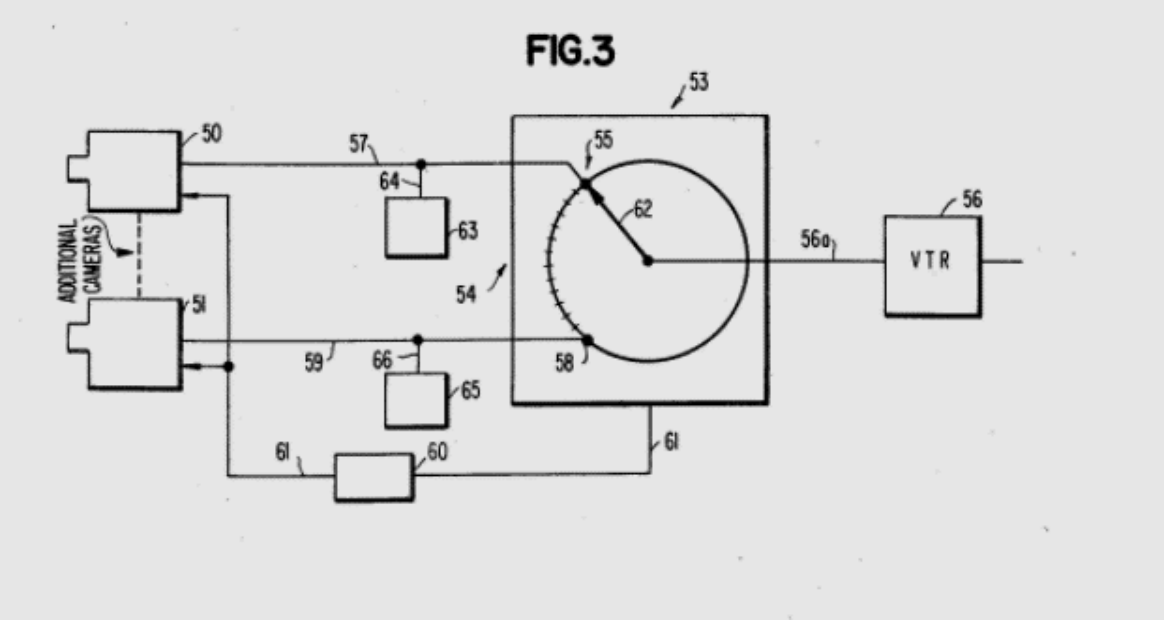

FIG. 4: Shows another sampling means.

DESCRIPTION

The present invention provides a laptop controlled agricultural system that effectively permits one to mechanically perform all major agricultural production system activities for the winning production of agricultural merchandise from the planting of a similar to the storage of a similar prepared purchasable, if desired, to associate finish use shopper.While the applications of the agricultural system of the current invention don't seem to be restricted, the current invention finds specific application during a flowering tree farm. As are evident, the agricultural system of the current invention can even be utilized for bush and cane fruits, nursery merchandise and plenty of vegetables.

For functions of illustration, however, the subsequent elaborate discussion is within the context of a flowering tree farm, on that as an example, apples, oranges or peaches, are big because the agricultural system of the current invention finds specific application to it.The term "fluid" within the gift application includes liquids, gases, solids in liquids (either in dissolved or particulate form), solids in gases associated combos thence helpful in an agricultural system, and also the term is purposefully given broad construction.

However, for functions of illustration, unless otherwise indicated, within the following discussion the term fluid refers to water, air or agricultural chemicals dissolved in water, as most typically the fluid delivery scheme is employed to "deliver" water, air or (dissolved) agricultural chemicals in water to desired points.

While the operation of farming is viewed by several people as a rather easy procedure, in fact, a considerable variety of rather subtle skills are necessary for winning agricultural production.

For instance, a partial listing of the activities conducted following standard agricultural production strategies on a fruit farm embody liming (pH control), fertilizing (provision of nutrients), pruning (plant growth control), brush removal (field sanitation), frost protection (temperature control), spraying (control of insects and disease), thinning, weeding (control of unwanted plant species),

cultivation (control of soil permeability), irrigation (moisture control), harvesting, shipping to a works (conveying), improvement of the agricultural product, culling and filler (grading of the agricultural product by quality variables), storage of the agricultural product, packing or boxing, transportation to the selling space, and also the like.

Referring to FIG. 1: central to the agricultural system of the current invention is laptop ten, typically shown disposed inside agricultural space eleven. laptop ten is elect from customary main-frame computers as are presently obtainable to the art, as an example, the PDP 11-20, obtainable from Digital instrumentality house., the Model 2100S obtainable from Hewlett-Packard and also the like.

It shall be clearly understood that the precise laptop elects to be used within the agricultural system of the current invention is comparatively non-critical, farewell because the laptop has spare memory capability.

As are apparent to 1 accomplished within the computing arts, computers as are delineated on top of usually comprise input associated output units which can embody a keyboard and an automatic output device, severally, a memory for storing information and programs, associated an arithmetic and logic unit for activity computations and different logic operations on information in restraint of a program.

The memory is also composed of a plurality of memory devices together with high-speed solid-state or core reminiscences for oftentimes used information, bulk reminiscences like mag tape for fewer oftentimes used information, read-only reminiscences like diode matrices for table operation operations, buffer and temporary storage registers then forth.

Other parameters are detected utilizing equipment presently obtainable that is definitely rendered compatible with the info transmission and laptop subsystems of the current invention, e.g., CO2 is detected with a tool as delineated with relevancy FIG. 2, air temperature by a semiconductor unit bead that is an element of the CO2 sensing element delineated with relevancy FIG. 2,

wind rate victimization associate gage, wind direction employing a weather vane coupled to a potentiometer (voltage output being proportional to the spatial relation of the potentiometer), wetness utilizing electrodes imbedded during a absorptive porous medium to live physical phenomenon, gas pressure victimization associate aneroid coupled to a potentiometer (providing a voltage output proportional to pressure).

the intensity of daylight utilizing a plant growth photometer obtainable from International light-weight, Inc., and precipitation by a gauge comprising 2 carbon electrodes during a graduated tube, the 2 carbon electrodes connected to a bridge circuit that becomes additional and additional unbalanced because the water level within the graduated tube rises.

A specific exemplification of a dioxide detector that finds use within the agricultural system of the current invention is shown in FIG. 2. touching on FIG. 2, the dioxide detector is usually indicated by numeral thirty, and contains a sun and water shade thirty-one, an instrumentality thirty-two shown holding H2O thirty-three, Associate in Nursing electrically and fluid resistant support thirty-four for carbon electrodes thirty-five and temperature semiconductor device thirty-six, applicable leads from the carbon electrodes (generally selected as 37) and from the semiconductor device (generally selected as 38).

A traditional Wheatstone bridge is selected thirty-nine. Direct detector leads from the Wheatstone bridge to the info transmission sub-system square measure typically selected forty, and effector leads from the info gear square measure typically selected forty-one. Leads forty and forty-one square measures, of course, in communication with the pc sub-system.

When the dioxide detector shown in FIG. a pair of is to be interrogated by the pc sub-system, the pc applies a right away voltage across the bridge thirty-nine and at an equivalent time measures the voltage across the remaining 2 branches of the bridge thirty-nine, the latter voltage being a sign of the dioxide concentration at the positioning.

The concentration of dioxide will be determined by measure the pH of a water sample contained in refluxing means that with a pH detector, a rather subtle arrangement, or just by taking conduction measurements of a pure water sample containing dioxide as acid, as shown in FIG. 2. At saturation, the pH of acid is three.8 at 77° F. acid concentration leads to Associate in Nursing more or less linear variation in pH at a given temperature.

It will, consequently, be necessary for the pc to at the same time live the temperature of the acid containing water sample undergoing analysis, however since air temperature measurements square measure typically needed throughout the agricultural system of the current invention, this doesn't impose a further burden upon this technique.

Referring to FIG. 3, camera fifty represents the primary camera in a very twelve camera set, and camera fifty-one represents the twelfth camera within the twelve-camera set; for functions for simplicity, cameras a pair of through eleven square measures omitted.53 typically indicates

Associate in Nursing electronic sampling switch supplied with twelve contacts typically indicated at fifty-four, contact fifty-five being shown to put the video magnetic recorder fifty-six in electrical communication with camera fifty via lines fifty-seven and 56a, and get in touch with fifty-eight being shown to place video magnetic recorder fifty-six into transmission with camera fifty-one via lines fifty-nine and 56a.Synchronization generator sixty is shown connecting switch fifty-three to cameras fifty and fifty-one (it would, of course, be connected to any or all cameras within the twelve-camera set) via line sixty-one.

It operates, of course, is to ensure that everyone frames square measure initiated at the right time. Assuming all twelve cameras square measure connected to the electronic sampling gate fifty-three and get in touch with switch sixty-two of electronic sampling gate fifty-three is revolved at a frame rate of thirty frames per second, then in twelve thirtieths of a second the video magnetic recorder would have recorded one frame from every of the twelve cameras, where after the higher than cycle is continual.

Upon playback, the video magnetic recorder fifty-six can deliver the frame from the primary camera fifty to a storage monitor sixty-three via lines 57/64, can deliver the primary frame from the second camera to a second storage monitor (not shown), etc., till the primary frame of camera fifty-one is delivered to storage monitor sixty-five via lines 59/66.

every storage monitor therefore receives a further frame each twelve thirtieths of a second. Ordinary tv monitors won't work on such a sign since they have a frame all thirtieth of a second, and cheap video

tape recorders cannot be speeded twelve-fold to produce such capabilities. Thus, the monitors should be supplied with a storage tube to keep up the frame received till ensuing frame is received.

Since the frame receipt rate within the embodiment represented in FIG. three is barely 2 and common fraction frames per second, the equipment represented doesn't give animation. If animation is needed for any purpose, the frame rate will be redoubled by assignment fewer cameras to every video magnetic recorder.

for instance, if solely 3 cameras square measure provided per electronic sampling gate, the frame receipt rate will be redoubled to 10 frames per second on playback, which might be Associate in Nursing adequate animation level for securing data from human speech, or for device of the hydro motor platform.

The advantage of the choice higher than represented over the sooner alternatives is that it provides full time coverage of all sample square measures; disadvantages are that image quality is somewhat degraded on playback which some grey scale distortions are going to be encountered thanks to the utilization of memory storage tubes within the storage monitors.

If desired, this defect will be overcome by utilizing a dynamic storage within the laptop and having the dynamic storage feed a traditional gas-discharge tube monitor. In such case, the memory storage tubes will be omitted.

The dynamic storage will use acoustic delay lines or alternative devices like charge-coupled devices. during this arrangement, just one monitor will be used if desired, and also the laptop will continue "refreshing" the image till the viewer (or computer) desires to look at ensuing consistent agricultural space.

Referring to FIG. 4, solely the primary and twelfth cameras within the twelve-camera array square measure shown, the primary camera being known as camera seventy and also the twelfth camera being known as camera seventy-one.

Camera seventy is shown in electrical communication with switch seventy-two via line seventy-three, and camera seventy-one is shown in electrical communication with switch seventy-two via line seventy-four. The second to eleventh cameras would even be joined to change seventy-two by approach of comparable lines typically indicated at seventy-five, during this instance the communication line for the second camera typically being indicated by seventy-six.

Camera seventy is additionally shown joined to a foreign controller and trained worker seventy-seven by manner of knowledge cable 78; remote controller and trained worker seventy-seven is in electrical communication with the pc (not shown) by manner of line seventy-nine.

Camera seventy-one is in electrical communication with remote controller and trained worker eighty by manner of line eighty-one, remote controller and trained worker eighty being joined to the pc (not shown) by manner of knowledge cable eighty-two.

Switch seventy-two is management led by switch control eighty-three by manner of line eighty-four, that switch management itself is joined to the pc by manner of knowledge cable eighty-five. Switch

management eighty-three permits switch seventy-two to position any of the cameras within the twelve-camera array into communications with any of the VTR's as can later be explained.

Returning currently to the remote controller and indexers seventy-seven and eighty, the functions of those specific devices can currently be explained in detail; since the functions of remote controller and indexers seventy-seven and eighty are considerably identical, just one rationalization are offered for remote controller and trained worker seventy-seven.

The first operate is to receive directions from the pc via line seventy-nine which allows the pan, tilt, zoom, focus, aperture and therefore the filter choice of camera seventy to be controlled.

Typically, this can be accomplished by the utilization of positioning motors within the remote controller and trained worker.

The positioning motors will be controlled in many various fashions; for instance, a digitally encoded signal will be generated by the pc and forwarded to the remote controller and trained worker seventy-seven via line seventy-nine, a decoder (not shown) within the remote controller and trained worker will then convert the digitally encoded signal to an analog signal and by selection offer power to drive the motors to manage pan, tilt, zoom, focus, aperture and filter choice. Remote controlled cameras of this sort are obtainable as current state of the art technology.

The second operate of and trained worker seventy-seven is actually to advise the pc via knowledge cable seventy-nine that camera is undergoing remote control and/or viewing (indexing). Any typical state of the art categorization signal will be applied to line seventy-nine and forwarded to the pc for applicable recognition of the camera concerned, for instance, a ground signal, a twenty Hertz pulse, and therefore the like.

If a considerable variety of cameras are being used, the trained worker most ideally would be a binary variety generator that, once the pc connects a precise VTR to a precise camera, generates a binary variety representative of the camera undergoing viewing.

The purpose of switch seventy-two is to supply reliable Ness and most concentration of either cameras or of VTR's, i.e., as a review of FIG. four can indicate, reducing the amount of switch verticals as diagrammatical by eighty-seven permits the number of cameras to be reduced, and reducing the amount of switch horizontals as indicated by eighty-six permits the amount of VTR's to be reduced.

As are appreciated by one delicate within the art, switch seventy-two as shown in FIG. four is really a twelve-by-twelve array, and just one switch horizontal eighty-six and one switch vertical eighty-seven is shown for functions of simplicity.

In fact, even within the twelve-by-twelve array shown in FIG. 4, switch seventy-two is a concentrating suggests that since every camera will be, if desired, a multi-functional device, having a plurality of filters, zoom capability and therefore the like.

Since the pc determines space to be viewed and therefore the camera that is to look at that area, the pc will build the selection of the camera and therefore the space to be viewed through switch management eighty-three, camera management usually being conducted in AN open-loop fashion, although if the

number of selections concerned is giant, as is that the case with the embodiment of FIG. 4, feedback management is fascinating. for instance, management will be settled as follows:

The pan, tilt and zoom servomotors within the remote controller and indexers seventy-seven and eighty will be coupled to a resistance potentiometer so the position of the camera ends up in an encoded signal specific to at least one specific resistance price, the encoded price being transmitted to the pc. If this embodiment is practiced, AN analog to digital device is, of course, necessary.

A second technique of accomplishing this result allows identification of the homogenized agricultural area(s) being viewed to be achieved. Visually noticeable indicators like will be mechanically taken by the pc e.g., a coded sign mounted on a stake within the field) will be accustomed allow the camera to scan variety of indicators and, once the acceptable visual indicator is scanned by the camera and therefore the recognition pattern on that known by the pc, the camera is trained upon the specified space.

This technique additionally allows precise registration of the scene as is needed once an equivalent space is to be discovered at completely different times, and therefore the 2 observations are to be compared by the pc for call analysis.

The sending scheme for forwarding data generated by the direct and indirect sensing means that to computing means that and for sending directions from the computing means that via interfacing means that (controllers) varied to varied to numerous} devices (field effectors) within the agricultural space to perform various functions. A computing scheme connected by manner of aforesaid information sending scheme to aforesaid indirect and direct sensing means that during a pattern of the many feedback loops.

The computing means that is programmed to alter correlation of information received from the indirect and direct sensing means that and to come up with acceptable directions to accomplish a substantive range of functions needed for the operation of the machine-controlled agricultural production system of this invention as are later represented intimately, including, however not restricted to, the management of the subsequent subsystems.

A fluid delivery scheme that provides:Means for delivering water, chemicals in liquid or aerosolized type, air, and also the wish to varied elements of the agricultural production area; and Means for providing power to varied peripheral devices that utilize the ability of moving liquid and/or gases-for example, a water power-driven (hydro motor) platform.A field operations scheme that, during an extremely most popular embodiment, includes means that to reap agricultural merchandise, convey the agricultural merchandise, grade the agricultural merchandise, store the agricultural merchandise, and pack the agricultural merchandise.

additionally, to the on top of means that that area unit basically involved with presenting the agricultural merchandise during a type amenable for selling, in addition means that area unit provided for plant care, e.g., pruning, dilution and also the like.A field operations scheme that accomplishes the functions of fruit gathering, fruit transfer, fruit grading and fruit storage that, during a most popular embodiment of this invention, accomplishes the on top of functions utilizing fluid received from the fluid delivery scheme of this invention.

It's additionally extremely most popular that such fluid power-driven means that be utilized within the agricultural system of this invention for tree care, e.g., pruning of trees, dilution of trees and also the like.

The field operations will be accomplished, if desired, utilizing a vehicle that is power-driven by fluid, usually water, derived from the fluid delivery scheme of this invention by means that of a water-to-mechanical convertor (hereafter usually known as a hydro motor platform).

CLAIMS

1. A computerized system for the assembly of agricultural merchandise in AN agricultural space that includes a plurality of homogenous agricultural areas, same system comprising:sensing means that for sensing a plurality of desired parameters in same plurality of homogenous agricultural areas, that parameters area unit necessary to realize desired agricultural product growth, and for generating sensing element information output representative of same parameters;a plurality of various management led means that operative in response to by selection applied control signals for manufacturing desired changes in same parameters;.computing means that for examination same sensing element information output to pre-established standards for same plurality of parameters in same agricultural areas, same computing means that being programmed to get same management signals as a results of the comparison of same sensing element information output and same pre-established standards each directly and in relevance the detected inter-relationship of such comparisons from others of same parameters and to optimize same management signals; andinformation transmission means that connecting same sensing means that and same controlled means that to same computing means that for receiving same sensing element information output from same sensing means that and sending same sensing element information output to same computing means that, and for receiving same management signal from same computing means that and sending same management signal to same controlled means that, same information transmission means that comprising means that for secret writing and multiplexing sensing element information output from a plurality of same sensing means that onto one information transmission and means that for secret writing and multiplexing management signals for a plurality of same controlled means that onto one information transmission.
2. According to claim1# the invention is to a whereby same information transmission means that includes a combine of conductors for two-directional transmission, and code sleuthing means that related to every of same sensing means that and same controlled means that and aware of coded signals on same combine of conductors for connecting same sensing means that and same controlled means that to same computing means that.
3. According to claim1,2# the invention is to a whereby same information transmission means that includes a matrix of conductors in same agricultural space, same sensing means that and same controlled means that being situated at intersections of conductors in same matrix and aware of the synchronal prevalence of a minimum of 2 signals at an intersection for effort.
4. According to claim1,2,3# the invention is to a comprising an influence distribution network for providing electrical energy to same sensing means that and to same controlled means that, same information transmission means that being congruent with same power distribution network.

5. According to claim1,2,3,4# the invention is to a whereby the facility and management signals area unit multiplexed onto identical lead.
6. According to claim1,2,3# the invention is to a same sensing means that includes each direct sensing means that in same homogenous agricultural space for directly measurement same parameters, and indirect sensing means that situated at a degree remote from same homogenous agricultural space for sleuthing and measurement radiation from same homogenous agricultural areas as an indirect mensuration of same parameters.
7. According to claim1,2,3# the invention is to a automatic management device for dominant irrigation, spraying and sprinkling of cultures, by controlled unharness of water therefor, comprising in combination: an electrical sensing element of close lighting; an electrical sensing element of out of doors temperature; means that for establishing electrical reference values for close lighting and out of doors temperature; comparator means that for severally examination the outputs of same sensors with same reference values; a logic circuit aware of a group of planned conditions of the outputs of same comparator means that; relay means that operated from the output of same logic circuit for dominant the same unharness of water; and means that activated from the output of same circuit for resetting same relay means when a determined length of your time following their activation.

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