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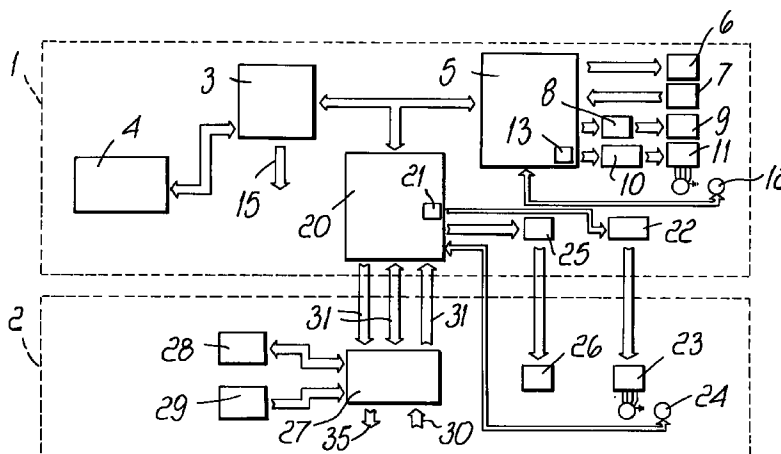
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(54) **Master-slave architecture particularly for knitting machines for hosiery and the like**

(57) A master/slave architecture, particularly for knitting machines for hosiery, comprising a first knitting machine for hosiery and a second knitting machine for

hosiery which are connected one another, the second machine (1) being driven by the first machine (2).



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Description

[0001] The present invention relates to a master/slave architecture particularly for knitting machines for hosiery.

[0002] It is known that knitting machines for hosiery currently in use have, on board each machine, both the mechanical part and the electronic part, which are capable of operating each machine independently.

[0003] The electronic part is composed of a micro-processor, software and a database with which the microprocessor communicates in order to determine the active setup parameters of the machine as a function of the type of knitting to be performed on said machine.

[0004] The microprocessor accordingly controls needle selection and all the mechanical parts of the machine in which it is installed.

[0005] Although this solution is highly functional from the point of view of the reliability and operating capability of the machine, it has a drawback due to the fact that each machine must be equipped both with the mechanical part and with the electronic part and therefore the cost of the hardware is added to the cost of the mechanical part, which is necessarily present for the operation of the machine.

[0006] In situations in which it is desirable to considerably reduce costs, this solution is not the best, also in view of the need to frequently replace knitting machines for hosiery owing to their continuous evolution and to the ever-improving performance that said machines can offer every time a new model is introduced.

[0007] The aim of the present invention is to provide a master/slave architecture, particularly for knitting machines for hosiery, in which it is possible to reduce the costs of the machines without however reducing the production capacity and the quality of the product supplied by each machine.

[0008] Within the scope of this aim, an object of the present invention is to provide a master/slave architecture, particularly for knitting machines for hosiery, in which maintenance is simplified.

[0009] Another object of the present invention is to provide a master/slave architecture, particularly for knitting machines for hosiery, which is highly reliable, relatively easy to provide and at low costs.

[0010] This aim, these objects and others which will become apparent hereinafter are achieved by a master/slave architecture, particularly for knitting machines for hosiery, characterized in that it comprises a first knitting machine for hosiery and a second knitting machine for hosiery which are connected one another, said second machine being driven by said first machine.

[0011] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred embodiment of the architecture according to the present invention, illustrated only by way of non-limitative example in the

accompanying drawings, wherein the only figure is a block diagram of the architecture provided according to the present invention.

[0012] With reference therefore to the only figure, the architecture according to the invention is a master/slave type architecture, in which two knitting machines for hosiery, of which one is designated "master" and the other one is designated "slave", are mutually linked and the operation of the slave machine is strictly dependent on the operation of the master machine.

[0013] In the figure, the reference numeral 1 designates the portion of the block diagram related to the master machine and the reference numeral 2 designates the portion of the block diagram related to the slave machine.

[0014] In detail, the master machine has processing means which are conveniently constituted by a CPU 3 which is interfaced on one side with data input and display means 4 suitable to constitute an interface between an operator and the master machine (and the slave machine) and, on the other side, with interface means 5 of the master machine 1, which allow to interface the electronic part of the machine with the mechanical part. Accordingly, there are provided output means 6, input means 7 (sensors), means 8 for control and connection to step motors 9 of the master machine and inverter means 10 connected to the main motor 11 of the needle cylinder of the master machine 1, said main motor 11 being connected to means for detecting the position of the needle cylinder, said means being conveniently constituted by an encoder 12 whose output is feedback to the interface means 5.

[0015] The inverter means 10 are connected to a DAC 13 which is provided in the interface means 5.

[0016] The processing means 3 are conveniently connected by a serial connection 15 to an external computer or, for example, to another master machine.

[0017] Interface means 20 for the slave machine 2 are further provided in the master machine 1 and comprise a DAC 21 which is connected to inverter means 22.

[0018] The interface means 20 are further connected to means 25 for controlling step motors 26 of the slave machine 2.

[0019] The slave machine 2 proper therefore comprises only the main motor 23 of the machine, which is connected to the inverter means 22, which is in turn connected to an encoder 24 which feeds back its output to the interface means 20 of the slave machine 2; step motors 26 are further provided in the slave machine in order to actuate the various servomechanisms and are connected to the control means 25, which are instead accommodated in the master machine.

[0020] Finally, the slave machine 2 has input/output devices 27 which are connected to a display 28 and to command input means 29; said input/output devices 27 receive in input signals 30 which originate from sensors arranged on the slave machine 2 and control electric valves 35 which are connected to the output lines.

[0021] The input/output devices 27 are connected by means of a synchronous serial bus 31 to the interface means 20 of the slave machine 2.

[0022] The connection between the master machine 1 and the slave machine 2 is thus entrusted to the bus 31 and to the signals in output from the step motor control means 25 and from the inverter means 22 which control the main motor 23 of the slave machine 2.

[0023] In this manner, the main electronic part of a knitting machine for hosiery is located exclusively in the master machine 1 and the slave machine 2 is entirely dependent, as regards the electronic part, on the master machine 1.

[0024] This allows to achieve a great cost reduction without reducing the production capabilities of the slave machine with respect to the master machine.

[0025] The slave machine operates asynchronously with respect to the master machine and can produce either the same item being formed on the master machine or a different item, since the programming of the slave machine performed by the interface means 4 of the master machine 1 can be performed independently of the master machine 1.

[0026] The software of the microprocessor used in the master machine is in fact of the multitasking type, i.e., it can perform a plurality of mutually independent tasks in sequence.

[0027] The slave machine 2 is not provided with the corresponding electrical cabinet usually meant to contain the electronic part of a knitting machine for hosiery.

[0028] In practice it has been observed that the architecture according to the present invention fully achieves the intended aim and objects, since it allows to drastically reduce the costs of a knitting machine for hosiery because said machine is controlled by a knitting machine for hosiery which is similar as regards the mechanical part but is provided with an electronic part which is capable of controlling the first knitting machine for hosiery as well.

[0029] The architecture thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may also be replaced with other technically equivalent elements.

[0030] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0031] The disclosures in Italian Patent Application No. MI98A001229 from which this application claims priority are incorporated herein by reference.

[0032] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A master/slave architecture, particularly for knitting machines for hosiery and the like, characterized in that it comprises a first knitting machine for hosiery and a second knitting machine for hosiery which are connected one another, said second machine being driven by said first machine.
2. The architecture according to claim 1, characterized in that said first machine comprises an electronic part which is suitable to control said second machine, said second machine having only the mechanical parts that allow it to function.
3. The architecture according to claim 2, characterized in that said electronic part of said first machine comprises processing means which are suitable to communicate with interface means of said first machine and with interface means of said second machine.
4. The architecture according to claim 3, characterized in that said interface means of said first machine and of said second machine are provided in said first machine.
5. The architecture according to claim 4, characterized in that said interface means of said second machine are interfaced with means for controlling step motors of said second machine and with inverter means which are suitable to control the main motor of said second machine.
6. The architecture according to claim 3, characterized in that said interface means of said first machine are connected to means for controlling step motors of said first machine, to means for emitting output signals, to means for receiving input signals, and to inverter means which are meant to control the main motor of said first machine.
7. The architecture according to claim 2, characterized in that said processing means are interfaced with operator interface means which allow to set up said first machine and said second machine.
8. The architecture according to one or more of the preceding claims, characterized in that said second machine comprises input/output means which are connected, by means of a bus, to said interface means of said second machine which are provided in said first machine.
9. The architecture according to one or more of the preceding claims, characterized in that said second machine further comprises step motors and a main motor which are respectively connected to said

means for controlling step motors of the second machine and said inverter means of the second machine, which are accommodated in said first machine.

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10. The architecture according to one or more of the preceding claims, characterized in that said input/output means of said second machine are interfaced with display means and with command setup means.

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11. The architecture according to one or more of the preceding claims, characterized in that said processing means comprise a microprocessor provided with a software of the multitasking type for controlling said first machine and said second machine.

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