

The invention relates to a control device for a printing machine with a control panel having a plurality of pushbutton keys or similar actuating devices, in which control device a first group of pushbutton keys is provided to select a command or operating state to be initiated, at least two manipulations being required to initiate execution of the command or alteration of the operating state, having at least one display panel, in particular an LED panel, a second group of pushbutton keys being provided, it being possible for information supplied on a display panel to be selected by actuating such a pushbutton key, each pushbutton key of the second group of pushbutton keys being allocated a visually switchable [sic] display, it being possible for said display to be activated by actuating a pushbutton key of the first group of pushbutton keys, and a third group of pushbutton keys being provided in order to make a command effective or ineffective for one or more of the printing units.

The invention is based on the pre-publication "Koebau-Colortronic", brochure 030/81-d from Koenig & Bauer. In this publication an electronic remote adjustment facility for the inking unit, damping system and plate register by means of a control console with a number of pushbutton keys is described.

Further control devices serving for the remote control of printing machines are known, for example, from GB-A-1,349,763. In known control devices of this type, a command can even be initiated by pressing a single key, thereby giving rise to possibilities of error. If, for example, in GB-A-1,349,763 it is desired to activate the second adjusting member (22b) on the "remote" plate (21a), the "remote" plate first has to be selected by actuating the key (21a) and then the key (22b) has to be actuated. If the machine operator inadvertently presses the key (22a) located next to it, an adjustment, that is to say of the first adjusting member, is immediately executed. To eliminate the undesirable adjustment, a subsequent correction is necessary.

The object on which the invention is based is to design a control device of the type described in the introduction, in such a way that the handling of the device is simplified and possibilities of error are reduced.

According to the invention, this object is achieved in that a fourth group of pushbutton keys (4-1 to 4-6) is provided, which are allocated to the printing colours to be processed, and which can be allocated to the pushbutton keys of the third group, in that a key of the first group is provided for a command "colour allocation" in order to allocate a pushbutton key of the fourth group in each case to the pushbutton keys of the third group, in that the pushbutton keys of the fourth group are provided in each case with an optical display, and in that the arrangement is such that, when a pushbutton key of the first group is actuated, visual displays of the fourth group, allocated positively to said pushbutton key, are actuated.

The execution of a command cannot yet be initiated by a single actuation of a single key of the first group. This reduces possibilities of error. Since the possibly complicated cancellation of an initiated command also becomes superfluous, it also becomes easier to operate the device.

The necessary plurality of manipulations can be provided in various ways, as desired, and it is possible, for example, to initiate a command only when the same command key is pressed twice. However, the arrangement is preferably such that a separate enter key is provided for initiating a command or a change in the machine operation state.

The control device has at least one display panel, in particular an LED panel. There is provided a second group of pushbutton keys for selecting at least one information item to be indicated on the display panel. Thus, on an offset printing machine with a plurality of setting cylinders provided for each printing unit, in order to set the ink-layer thickness profile the

actual state of the positions of the individual setting cylinders and optionally, instead, the desired state provided for a specific printing order can be displayed on an inking-zone display panel, and ink fountain-roller values (inking-strip length in the circumferential direction of the ink fountain roller) and register values can be indicated on a preferably numerical display panel. The pushbutton keys of the second group are intended to enable the printer, before and especially during the introduction of a command by pressing a pushbutton key of the first group, to call up the relevant information on the display panel, in order to check whether any changes, for example in the position of the setting cylinders, should be made before the execution of the command.

The pushbutton keys of the second group are each equipped with a visually [sic] switchable display. In particular, the arrangement can be such that, when a pushbutton key of the first group is actuated, visual displays of the second group which are allocated permanently to this actuatable pushbutton key are actuated. The permanent allocation of the visual displays, especially luminous displays, is carried out in such a way that, for each one of the commands or machine operation states to be initiated by actuating a pushbutton key of the first group, that pushbutton key of the second group or those pushbutton keys of the second group are identified, the allocated information of which the printer should know before the execution of the initiated command, in order, on the basis of his specialized knowledge, to judge whether he should make any further changes before the definitive execution of the command. This makes it simpler for the printer to operate the device, since these luminous displays or other visual displays draw his attention to the displays relevant in the particular case. The arrangement is appropriately such that keys of the second group can be actuated even without pressing a command initiation key. There can also be provision for ensuring that, after a key of the first group has been pressed, only a single key of the second

group is identified visually. In this case, the display allocated to this key can appropriately appear automatically on the display panel. If other displays are also relevant, there can be the possibility of displaying these other displays likewise, even without the associated key of the second group previously having been identified visually. It can be expedient, during the initiation of specific commands, to make at least one of the keys of the second group ineffective.

10 A third group of pushbutton keys is provided for making effective or ineffective a command for one or more printing units. In the later exemplary embodiment, although most commands generally have to be executed in the same way for all printing units, there can nevertheless be instances in which the printer, on the basis of his experience, also wants to make the said commands effective only for a selection of the available printing units. In contrast, as regards the "positioning" command yet to be described later, that is to say the setting of the ink-layer thickness profile and ink fountain-roller values, in general a separate execution of the command for each of the individual printing units will be expedient. The arrangement can be such that the command applies to all the printing units when there is no particular printing-unit selection. This group of pushbutton keys can also be appropriate for printing machines with only one printing unit.

 In the invention there is provided a fourth group of pushbutton keys which are allocated to the printing inks to be used and which can be allocated to the pushbutton keys of the third group. In general, it is true that, on an offset printing machine with a predetermined number of printing units, for example two printing units, the first printing unit will often process the colour black and the second printing unit therefore the other colour. However, it can be expedient, in a particular instance, to depart from such a rigid allocation of the printing inks, and the embodiment of the invention just described enables the printer to

allocate the printing inks to the individual printing units, as desired. Internally, the device described in the exemplary embodiment admittedly works in such a way that, in the last analysis, only the individual printing units are controlled, for example their setting cylinders for the ink-layer thickness profile; however, the above-described allocation of keys of the fourth group, which are also designated here as colour keys, makes the colour allocation to the individual printing units clear to the printer, and according to embodiments of the invention it can also enable the printer, for example during the setting of the ink-layer thickness profile and ink fountain-roller values ("positioning" command), to carry out the execution of this command for a specific printing unit, for example printing unit number one, also by pressing the colour key allocated to this printing unit.

The above-described colour allocation has an importance going beyond simply making the operation of the machine easier when presetting values for the various ink-layer thickness profiles and ink fountain-roller values are fed to the control device by means of any methods of data transmission; the ink allocation described then ensures that these fed data, in actual fact, cause the adjustment of the setting cylinders only on those printing units which are allocated to the respective printing ink.

In one embodiment of the invention, each of the pushbutton keys of the fourth group, that is to say the colour keys, is provided with a visual display, and the arrangement is such that, by actuating a pushbutton key of the first group, visual displays of the fourth group almost (sic) allocated to the said pushbutton key are actuated. This embodiment can be expedient for those commands in which a restriction of the command to a specific printing ink or, what is equivalent, to a specific printing unit is appropriate. This embodiment can therefore be replaced with completely the same effect by another embodiment in which the visual displays are allocated not to the printing inks, but to the printing

units.

The embodiment of the invention just described can be developed to the effect that a further visual display of "all colours" or, which is completely equivalent, an "all printing units" display is provided. In the later exemplary embodiment, the arrangement is such that the last-mentioned "all colours" display or "all printing units" display is allocated no particular pushbutton key, but this display is included in the command execution when the printer does not limit the execution of the command to any one of the colours or any one of the printing units.

In an embodiment of the invention in which the printer can select information for display on the display panel, the arrangement is such that the values of the respectively indicated information can be changed, and that the changed values for the control device become effective only when a command execution is initiated. The advantage of this is that, for example, the printer can change an ink-layer thickness profile on the display panel according to his own ideas, but still have the possibility at any time of preventing the definitive setting of this ink-layer thickness profile changed in this way. This embodiment is important especially when information stored in the device is overwritten, that is to say destroyed, as a result of the definitive reception of the changed values of the information.

In one embodiment of the invention, a warning display which becomes effective when actuating said key is provided for at least one of the keys of the first group. The advantage of this embodiment is that the printer can be advised that a command or a plurality of commands should appropriately be executed beforehand, before the execution of the command initiated by him, especially in order to prevent a loss of information. According to one embodiment of the invention, the warning display can have a device for actuating a visual display which is allocated to at least one of the remaining keys of the first group. According to a development, the

arrangement can be such that the said remaining keys of the first group are marked visually, especially by a luminous display, only when the printer presses a particular key. In this last-mentioned case, therefore, the printer is advised only generally by the warning display that there are one or more commands which should possibly be executed before the execution of the initiated command, and insofar as the printer is not sure whether he has already initiated these commands or which commands these are, he can press the said key and display by means of the visual display these commands possibly to be executed beforehand.

According to embodiments of the invention, it can be expedient, after a key of the first group has been actuated, to make ineffective those keys of the operating panel of which the actuation is not appropriate or could even cause faults. As a rule, these are at least the other keys of the first group.

In an embodiment of the invention which can also be implemented independently of the invention described in the introduction, a key for initiating a format-shift command is provided. This command is useful especially when printing orders originally intended for a smaller, hence narrower printing machine are to be executed on a wider machine. This command is also useful when the order intended for a narrow machine is executed on a wide machine twice at the same time side by side on the same sheet.

Further features of the invention relate to the various commands which are allocated to the pushbutton keys of the first group and which are presented in the part description and in the claims.

A clear key is appropriately provided so that a command not yet initiated for execution or a command being executed, but not yet completed, can be aborted.

Insofar as pushbutton keys are mentioned above and in the following description, it is expressly pointed out that pushbutton keys are considered only as a highly advantageous type of actuating devices to be actuated by

the printer and intended for communicating instructions from the printer to the control device, but that all other devices suitable for communicating instructions also come within the scope of the invention, such as sensors, touch-sensitive keys, rotary switches, rocker switches and actuation by light pen. It is considered especially important for easy actuation by the printer that the individual actuating elements, for example pushbutton keys or the like, should have their set location on the operating panel, that is to say the printer does not, for example, have to enter his instructions via a typewriter keyboard, possibly also at the same time noting instructions which appear on a video screen; these last-described possibilities, although being considered less advantageous in comparison with the spatially fixed arrangement of the individual pushbutton keys on an operating panel, nevertheless are not intended to be excluded from the protection of the invention.

Further features and advantages of the invention emerge from the following description of an exemplary embodiment of the invention, by reference to the drawing showing details essential to the invention, and from the claims. The individual features can be implemented either each individually or severally in any combination in an embodiment of the invention. In the drawing:

Fig. 1 shows the main part of the operating panel of a control device for a printing machine,

Fig. 2 shows a display panel of the operating panel with further control keys.

The operating panel 10 shown in Fig. 1 has a first group of pushbutton keys which are designated by the reference symbols 1-1 to 1-17. These pushbutton keys are command initiation keys, that is to say keys for initiating a command and, in one case, also for initiating an operation state of the control device.

Furthermore, the operating panel 10 has a second group of pushbutton keys which are designated by the reference symbols 2-1 to 2-6 and which serve for selecting an information item to be indicated on a

display panel 20 in Fig. 2 and 50 in Fig. 1. In the example, a third group of pushbutton keys has only the two pushbutton keys 3-1 and 3-2 which are identified by the numerals 1 and 2 and which, on the assumption that the control device is provided for a printing machine with only two printing units, are allocated to these two printing units. Underneath the keys 3-1 and 3-2 in the operating panel 10 there are still four empty places which, when the control device is provided for a printing machine with a maximum of 6 printing units, can also be equipped with a number of keys corresponding to the number of printing units.

A fourth group of pushbutton keys identified by the reference symbols 4-1 to 4-6 serve for allocating colours to the printing units and are designated hereafter in brief as colour keys. From the top downwards, these colour keys are allocated to the colours black, cyan, magenta and yellow, and also two additional colours identified by the letters X and Z. If two identical colours, for example black, are used in the printing machine, appropriately the key X (4-5) is used for the verso printing unit and the key B (4-1) for the recto printing unit, so that a definite allocation of the colours to the printing units is possible. With the machine, the colours black and cyan can be printed in a first run and the colours magenta and yellow printed in a second run for one and the same printing order.

In the upper part, the operating panel 10 moreover possesses an enter key 5, by means of which a command input is completed and the execution of the command initiated, and furthermore a warning display key 6 and a clear key 7, by means of which a command not yet entered completely can be cancelled and a command already being executed, but not yet concluded completely, can be interrupted. Moreover, there is a key-operated switch 8 which makes it possible to switch the entire device on and off or, in the position "2", merely make the displays of the device effective, but without the possibility of entering any commands or control signals by means of the

device.

Closely adjacent to the individual colour keys are respective light-emitting diodes 14-1 to 14-6 and furthermore a light-emitting diode 14-7 marking "all colours" jointly. In the lower part of the operating panel, there are command initiation keys 1-13 and 1-14 for switching on a light pen and also control keys 16-1 and 16-2 and a command initiation key 1-15. When the key 1-15 is actuated, the control keys 16-1 and 16-2 serve for the joint percentage adjustment of the ink-layer thickness profile, otherwise for adjusting the ink fountain-roller value. The value of the percentage adjustment of the ink-layer thickness profile or of the ink fountain-roller value is indicated on a numerical display 51. Control keys 17-1 and 17-2 as well as 18-1 and 18-2 serve for adjusting the circumferential register and side register of the printing machine respectively. The adjustment for a single printing unit is carried out in conjunction with one of the pushbutton keys 3 or 4. If desired, by means of a command initiation key 1-17 the operation of shifting by a desired number of millimetres entered by means of the keys 17 and 18 by appropriately frequent inching can be extended to all the registers. By means of a command initiation key 1-16, all or individual registers can be set to zero in conjunction with the keys 3,4 and the displays 14-1 to 14-7. By means of numerical displays 52 and 53, the positions or shift mechanisms of the respective registers can be indicated or preselected by means of the keys 17, 18. The position of the circumferential registers is indicated by a light-emitting diode panel 26 with six columns, each with 15 light-emitting diodes. Since only the relative position of the registers in relation to one another is often relevant, by means of a control key 27 the display for the circumferential registers can be set to zero independently of their actual position, so that further changes can easily be made.

The operating panel 10 also has a light-emitting diode 30 for indicating a standstill of the printing

machine, in order to advise the printer that, for example, register adjustment is not possible during this standstill. Furthermore, there is a light-emitting diode 31 which indicates a failure of the computer 1 contained in the control device.

A numerical display 32 makes it possible, when errors or faults occur, to give the printer an indication as to the nature of the error or fault.

The diode display panel 20 in Fig. 2 contains 32 columns, each with 16 light-emitting diodes which are allocated to the individual inking zones of the printing machine, each inking zone having a setting cylinder for setting the ink-layer thickness profile. The inking zones are designated by Z1 to Z32.

Underneath each light-emitting diode column of the display panel 20 are two control keys 36-1 and 36-2. The light-emitting diode panel 20 serves not only to indicate the actual position of the setting cylinders, but also other purposes. By means of the control keys 36, the display of the light-emitting diode panel 20 can be changed for each individual column, and further control operations explained later can also be carried out.

The individual command initiation keys 1-1 to 1-17 have the following significance:

Key 1-1: positioning command.

With this command, the position of the setting cylinders for the individual inking zones and ink fountain-roller values can be changed.

Key 1-2: follow-up control command.

With this command, the printer can ensure that measured values coming from outside and setting values calculated from these for the setting cylinders and ink fountain rollers are actually used for the once-only readjustment of the setting cylinders and ink fountain rollers by the control device.

Key 1-3: automatic follow-up command.

This command can initiate a continuous automatic readjustment of the setting cylinders and ink fountain rollers as a function of measured values which come from

outside, for example from a measuring instrument, and which are converted into setting values in the control device.

Key 1-4: colour allocation command.

5 With this command, a standard allocation (in the order of the printing units: black, cyan, magenta, yellow, X, Z; Fig. 1), stored in the control device, of the individual colours to the individual printing units can be changed as required. In the standard allocation, 10 each printing unit is allocated that colour identified by the colour key 4 which is arranged in the operating panel 10 immediately on the right next to the corresponding printing-unit key. When the colour allocation command is initiated, the printer, by simultaneously pressing a 15 printing-unit key 3 and a colour key 4, can preselect the desired different allocation, indicate it (by the lighting up of the pressed key) and produce it by means of the enter key 5.

Key 1-5: colour reduction command.

20 With this command, the ink-layer thickness for all the inking zones and any printing units can be brought to the value zero and the ink fountain-roller value brought to the maximum value if the fountain roller and the following inking rollers are to be made ink-free 25 as quickly as possible.

Key 1-6: format shift command.

 With this command, ink-layer thickness profiles can be shifted laterally zone by zone. This can be useful in a change of order from a smaller machine to a larger 30 machine, because it is generally desirable for the sheets or webs to be printed to run through the printing machine symmetrically, that is to say at equal distances from the ends of the printing cylinders. If the presetting values for the individual inking zones present, for example, on 35 magnetic tape for a smaller machine are entered in a larger machine, then these entered values do not correspond to the requisite symmetrical arrangement of the sheet in the machine, because, in a smaller machine having, for example, 16 inking zones, the zones Z1 to Z16

correspond to the complete machine width, whereas the zones Z1 to Z16 on a machine with 32 zones correspond to the left half of the machine, and therefore a shift to the right by the amount of eight inking zones is necessary.

This command can also be used in order to transfer the narrow format with a width of 16 zones, just assumed in the example, to a larger machine in such a way that two-up production is possible, that is to say the larger machine prints twice side by side on a wide sheet or a wide paper web the design which the small machine has printed only once.

After the actuation of the "format shift" command initiation key 1-6, this key itself, the light-emitting diode 14-7 "all colours" and the "memory display" key 2-4 light up continuously, because the format shift appropriately relates to all the printing units and therefore all the colours and the operation of the shift of format must always take place before the positioning, that is to say the setting of the setting cylinders. By means of any key 36-1, the profile can be shifted from left to right zone by zone, whenever the key is pressed the profile travelling one zone further or, with continuous actuation, continuous advance taking place. By means of any key 36-2, the profile can be shifted to the left zone by zone in a similar way. The display present in the light-emitting diode column of the zone Z32 before a shift to the right appears in the light-emitting diode column Z1 after the shift one step to the right; in the same way, in a display memory connected to the light-emitting diode display 20, the data contained there are shifted cyclically, so that no data can be lost during the shift to the right and to the left. When the correct shift has taken place, the printer actuates the enter key 5, with the result that the data contained hitherto in the display memory are received in a presetting memory of the device (the data hitherto present there are overwritten) and are now available for the setting of the setting cylinders, this setting being initiated by

pressing the key 1-1 (positioning).

Key 1-7: format limitation command.

5 This command serves for setting the ink-layer thickness to zero once for all the zones outside the format to be printed, on all the printing units, and to exclude calculation operations for measured values coming from outside. After the actuation of the key 1-7 which lights up continuously after actuation, a format limitation possibly present is indicated by the lighting up of
10 a special light-emitting diode 40 provided underneath each light-emitting diode column of the display panel 20, in respect of all the format-limited zones, whereas the light-emitting diodes 40 of the non-limited zones flash. Other light-emitting diodes of the display panel 20 do
15 not light up. In the operating panel 10, the light-emitting diode 14-7 "all colours" lights up, and in the exemplary embodiment no other luminous displays appear. However if the key 36-1 is actuated in respect of a limited zone, the format limitation is cancelled and the
20 associated diode 40 flashes. A hitherto non-limited zone is limited by actuating the associated key 36-2, and the associated light-emitting diode 40 changes from the flashing state to the continuously illuminated state. The format limitation takes place in such a way that, when a
25 key 36-2 in the right half of the display panel 20 is pressed, the zone allocated to this key and all the zones located on the right of this are limited, whereas, when a key 36-2 in the left half of the display panel 20 is pressed, this zone and all the zones located on the left
30 of it are limited. The release of format-limited zones by pressing a key 36-1 takes place from the pressed key towards the format centre. Irrespective of the initiated command, the format-limited zones are visible in the follow-up display (key 2-2) in the diode row 40.
35 Key 1-8: blocking or release of zones command.

This command, by the actuation of the keys 36-2 or 36-1, makes it possible to block or release any zones for the follow-up control and automatic follow-up commands. This blocking, visible in the follow-up display

of the diode row 40, has no significance for other commands. In particular, manual adjustment in the follow-up control and automatic follow-up commands is possible, whereas with these commands the non-blocked zones are not
5 adjustable by hand. This command is appropriately executed separately for the individual colours of the printing units, and therefore after the key 1-8 has been pressed all those light-emitting diodes of the diodes 14-1 to 14-16 which correspond to a colour actually used flash. The
10 printer can now, by pressing one of the keys 4-1 to 4-6 or optionally also by pressing one of the printing-unit keys 3-1 to 3-2, select that colour and therefore also that printing unit for which zones are to be blocked and released. In these commands, only that respective zone of
15 which the associated pushbutton key 36-2 or 36-1 has been actuated is blocked or released.

The keys 1-9, 1-11 and 1-12 correspond to the read-in, recording and tape erase commands and relate to control commands for a magnetic-tape cassette unit which
20 is installed in the control device. If the printing machine connected to the control device is to be prepared for executing a new printing order, after the actuation of the pushbutton key 1-9 the presetting data stored on magnetic tape for the setting cylinders and ink fountain-
25 roller values are read into the display memory which is allocated to the display panels 20 and 50. The printer can view the entered values on the light-emitting diode panel 20 and display panel 50 and, for example, also detect whether an incorrect cassette has inadvertently
30 been read in or the data are defective. In this case, the command is interrupted by pressing the clear key 7, so that the entered data do not influence the working of the control device. In contrast, if the data are to be received definitively by the control device, the command
35 is brought to completion by pressing the enter key 5.

The key 1-10 ensures that the actual values of the position of the setting cylinders and ink fountain rollers are stored in the memory of the control device. When the actual values have been stored in this way, for

the further working of the control device they perform the function of desired values for the position of the setting cylinders or ink fountain rollers. It is also necessary for the actual values to be stored in the memory when these actual values are subsequently to be stored by means of the "tape recording" command 1-11, since a storage of data on magnetic tape takes place from the memory.

The tape erase command is used to prevent no longer current information from remaining on a tape and thereby possibly leading to errors in the machine setting. In addition, the tape is thereby made new again for a storage of other values.

It is indicated below during the initiation of which commands the warning key 6 lights up and which of the further command initiation keys in this case flash when the warning key 6 is pressed:

Key 1-1 (positioning command):

the key 1-4 (colour allocation command) flashes;

Key 1-5 (colour reduction command):

the key 1-10 (storage command) flashes;

Key 1-9 (read-in command):

the key 1-11 (recording command) flashes;

Key 1-10 (storage command) or key 1-11 (recording command):

the key 1-10 (storage command) flashes;

Key 1-12 (tape erase command):

the key 1-9 (read-in) flashes;

Key 1-13 or 1-14 (control keys for data input into the diode display panel 20 by light pen) or control key 1-9 (read-in command):

after the pressing of the warning key 6, the key 1-11 (recording command) flashes in each case.

The flashing of the said keys draws the printer's attention to a possibly imminent data loss. Should the printer wish to execute a command, marked by a flashing key, before the execution of the command just initiated, he presses the clear key 7 and initiates the desired command. When the command last initiated has finally been

completed by pressing the enter key 5, the command originally initiated and aborted, as just described, must be initiated again. The control device thus does not initiate commands itself, but the initiation of each
5 command must be carried out by the printer. It is also possible for the arrangement to be such that, when the command initiation key flashing after the actuation of the warning key 6 is pressed, the command allocated to this is initiated and the command initiated first is
10 cancelled, without the clear key 7 having to be actuated.

During the initiation of a command by pressing one of the command keys 1-1, 1-2, 1-3, 1-5, 1-6, 1-8 to 1-17 corresponding to commands which can appropriately be executed for individual, several or all colours or
15 printing units, the respective key itself and the light-emitting diode 14-7 light up continuously, but in addition the light-emitting diodes 14-1 to 14-6 allocated to the colour keys 4 flash. If a printing-unit key or colour key allocated to one of these flashing light-
20 emitting diodes is pressed, the originally flashing diode lights up continuously and the light-emitting diode 14-7 is extinguished. Further desired printing-unit or colour keys can be actuated in succession, and the allocated flashing light-emitting diode then always lights up
25 continuously and thus indicates the selected printing units or colours to the printer. The command is then executed on the actuated printing units or colours by means of the enter key 5. As the commands just mentioned towards the end show, this selection possibility also
30 exists for read-in from the magnetic tape, recording and erasure of the tape; a partial erasure is therefore also possible.

With the format limitation command 1-7, such an extension of the selection possibility to individual
35 printing units is not expedient, and therefore none of the diodes 14-1 to 14-6 flashes.

With the format shift command 1-6, although a shift for all the colours is useful in general, it can nevertheless be expedient to carry out the shift

operation only for a selection of the colours.

The keys 2-1 to 2-6 controlling the display on the light-emitting diode panel 20 have the following significance:

5 Key 2-1: density trend display; key 2-2: follow-up display; key 2-3: difference display; key 2-4: memory display; key 2-5: profile display; key 2-6: fine display. By pressing one of said keys, the allocated information is displayed on the displays 20 and 50.

10 The density trend display (2-1) indicates whether the actual values of the ink density measured by a sheet-measuring instrument diverge from the respective desired value and in what direction and to what extent.

15 The follow-up display (2-2) displays the measured values supplied from outside and values converted into control signals. The follow-up display switches on automatically when the follow-up control or automatic follow-up commands are initiated.

20 The difference display (2-3) indicates the difference between desired and actual values of the position of the setting cylinders and ink fountain-roller values.

The memory display (2-4) indicates the desired values for the position of the setting cylinders.

25 The profile display (2-5) indicates the actual position of the individual setting cylinders for each individual zone in 16 steps. Furthermore, the fine display which can be switched on in addition and which uses the same light-emitting diodes as the profile display indicates the exact position of the actual value
30 between two mutually adjacent light-emitting diodes of the profile display, this spacing of the light-emitting diodes used for the rough display being extended to 16 light-emitting diodes for the fine display. So that the
35 profile display and the fine display can be distinguished, the light-emitting diodes used for the fine display flicker and they are somewhat dimmer than the light-emitting diodes used for the profile display.

When the memory display (2-4), that is to say the

display of the stored desired values, is switched on by means of the command keys 1-13 or 1-14 relating to two light-pen commands of somewhat differing mode of operation, the printer can change the displayed profile selected by means of the key group 3 or 4 on the light-emitting diode panel 20 either by means of a light pen or by means of the keys 36-1 and 36-2 and, by pressing the enter key 5, can enter the thus changed profile for the selected colour into the memory of the device as a new desired value. By pressing the key 2-5 for the profile display and, if appropriate, additionally the key 2-6 for the fine display, the printer can display the actual values of the position of the setting cylinders and change these actual values accordingly likewise by means of the light pen or the keys 36-1 and 36-2.

If all the colours are selected in one of the said light-pen commands, an artificial profile appears on the light-emitting diode panel 20 in the form of a highly obtuse arrow tip which points upwards and extends over the entire width of the display panel 20 and the tip of which is located in the region of the format centre in the zones Z16 and Z17, in order to draw the printer's attention particularly to the fact that he has selected all the colours or all the printing units. For safety reasons, it is not possible for this displayed profile to be received in the memory directly, but on the contrary a command execution is possible only when the artificial profile has been changed by the printer in at least two zones.

On the numerical display 51 appears the ink fountain-roller value, that is to say the value of the ink fountain-roller stroke as a percentage of the maximum ink fountain-roller stroke possible on the printing machine. If all the printing units have been selected in the light-pen mode, an average value for the ink fountain-roller value, in the example the number 50, appears on the display 51. It is not directly possible, by pressing the enter key 5, to receive this value, with the result that all the ink fountain rollers would be set to

this value, but a command execution is possible only when an acknowledgement has occurred or the value displayed by the display 51 has been changed. In the example, this purpose is served by the keys 16-1 and 16-2. During the
5 inching of the key 16-1, the value displayed in the display 51 increases by 1. This value could be entered in the memory by pressing the enter key 5. On the other hand, if the value 50 is to be entered, the printer
10 inches the key 16-2 briefly and thereby returns the displayed value to 50 and can now enter this value by pressing the enter key 5. A visual marking of the display panel 51 identifying the selection of all the colours is made by the flashing of the number displayed in this display 51.

15 As soon as a key of the first group (1-1 to 1-17) is pressed, it lights up continuously. Keys of the operating panel 10 which, after the initiation of a command, are released for further actuation or light-emitting diodes or displays allocated to these flash, and
20 after the key has been pressed this or the allocated light-emitting diode or display lights up continuously. The enter key flashes after the initiation of a command, lights up after pressing and is extinguished after the execution of the command. At this moment, all the other
25 luminous displays involved in the executed command are also extinguished, and the display state before the initiation of the command is reselected automatically, that is to say that information displayed before the initiation of the last command is indicated on the
30 display panels.

The keys 2-1 to 2-6 are switched on by pressing and are switched off by repeated pressing or by another key 2. For a clearer distinction, the keys of the first group are orange and the keys of the second to fourth
35 group are white.

The above-described visual identifications of already actuated keys and of keys which appropriately can also be actuated by the printer and the above-described visual identifications of displays on the display panels

provide guidance for the operator, the printer thus being guided by the device itself while he is manipulating it. This guidance makes training easier, avoids errors and results in systematic working.



Patent claims

1. Control device for a printing machine with a control panel having a plurality of pushbutton keys or similar actuating devices, in which control device a first group of pushbutton keys (1-1 to 1-17) is provided to select a command or operating state to be initiated, at least two manipulations being required to initiate execution of the command or alteration of the operating state, having at least one display panel, in particular an LED panel, a second group of pushbutton keys (2-1 to 2-6) being provided, it being possible for information supplied on a display panel to be selected by actuating such a pushbutton key, each pushbutton key of the second group of pushbutton keys (2-1 to 2-6) being allocated a visually [sic] switchable display, it being possible for said display to be activated by actuating a pushbutton key of the first group of pushbutton keys (1-1 to 1-17), and a third group of pushbutton keys (3-1, 3-2) being provided in order to make a command effective or ineffective for one or more of the printing units, characterized
- in that a fourth group of pushbutton keys (4-1 to 4-6) is provided, which are allocated to the printing colours to be processed, and which can be allocated to the pushbutton keys (3-1, 3-2) of the third group,
 - in that a key of the first group is provided for a command "colour allocation" in order to allocate a pushbutton key (4-1 to 4-6) of the fourth group in each case to the pushbutton keys (3-1, 3-2) of the third group,
 - in that the pushbutton keys of the fourth group (4-1 to 4-6) are provided in each case with an optical display, and in that the arrangement is such that, when a pushbutton key of the first group is actuated, visual displays of the fourth group, allocated positively to said pushbutton key, are actuated.
2. Device according to Claim 1, characterized in that a separate enter key (5) is provided to initiate the execution of a command.



3. Device according to Claim 2, characterized in that the enter key (5) flashes when a command is entered and is illuminated during execution of the command.

4. Device according to at least one of the preceding
5 claims, characterized in that a further visual display (14-7), "all colours", is provided.

5. Device according to at least one of the preceding claims, characterized in that the arrangement is such that the values of the information displayed in each case
10 can be changed, and in that the changed values are only effective for the control device when execution of the command has been initiated.

6. Device according to at least one of the preceding claims, characterized in that a warning display is
15 provided for at least one of the keys of the first group, which warning display is effective when the said key is actuated.

7. Device according to at least one of the preceding claims, characterized in that a command, "light pen",
20 (keys 1-13, 1-14) is provided, in that, during light-pen operation, an artificial profile is displayed on the display panel (20) when all the colours have been selected, and in that the device is designed in such a way that execution of a command is only possible when the
25 artificial profile has been changed in at least two zones (Z1 to Z32).

8. Device according to at least one of the preceding claims, characterized in that a command, "light pen",
(keys 1-13, 1-14) is provided, in that, during light-pen
30 operation, an ink-ductor display for a mean value is displayed and characterized optically in a special manner when all the colours have been selected, and in that the device is designed in such a way that execution of a command is only possible when an acknowledgement has been
35 given by means of an allocated key (16-1, 16-2), or the displayed value has been changed.

9. Device according to at least one of the preceding claims, characterized in that a clear key (7) is provided to abort a command which has not yet been completed.