

[54] **CONTROL PANEL WITH DIAL SETTING TEMPLATE**

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[58] Field of Search **200/50 A, 50 C, 169 R, 200/42 R, 168 P, 168 PB**

[56] **References Cited**

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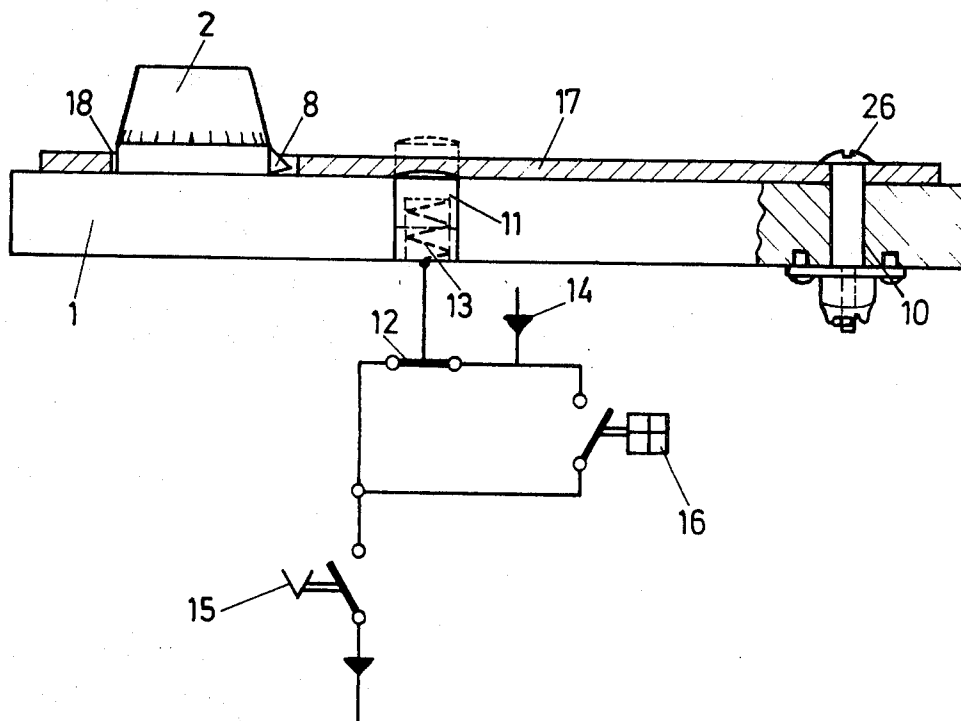
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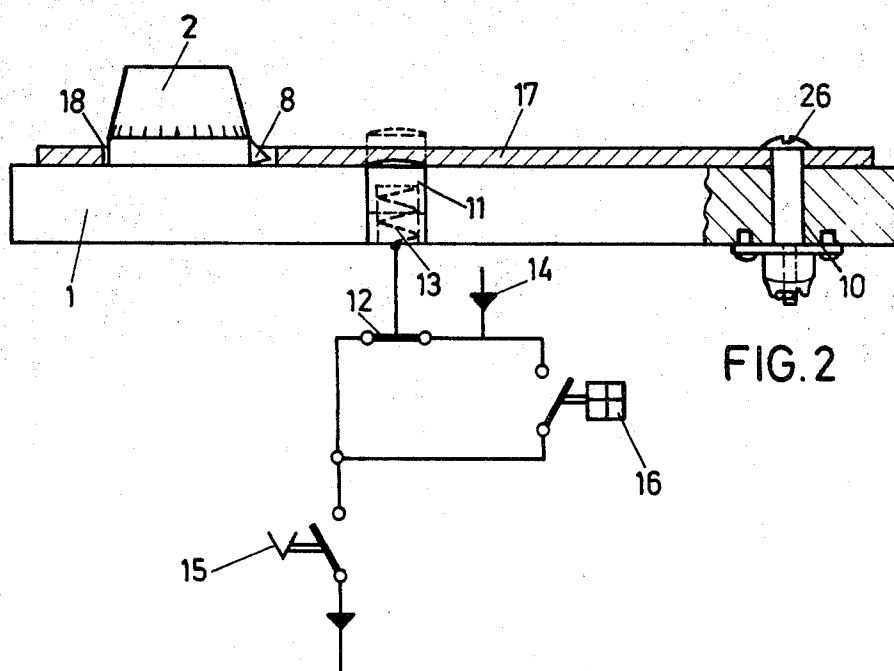
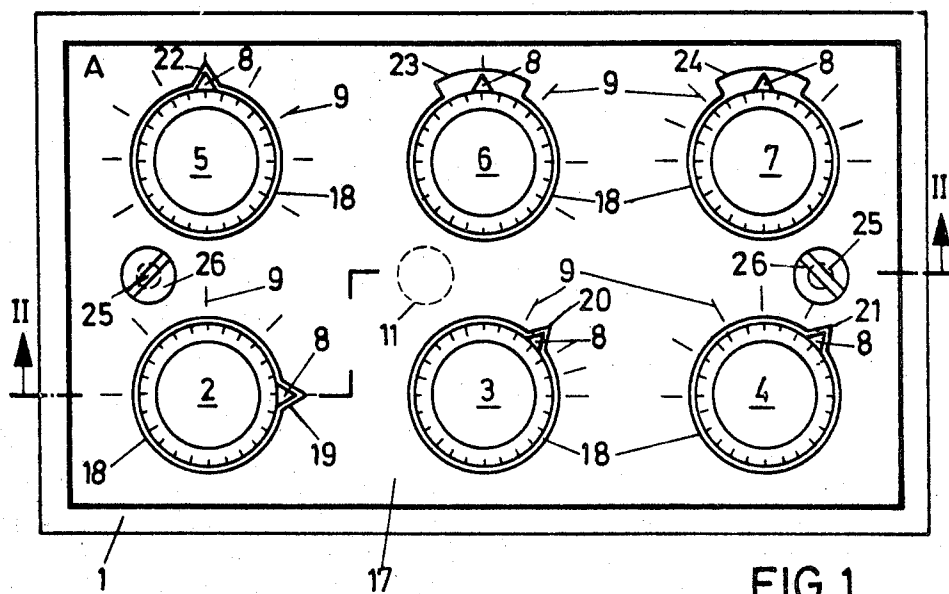
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[57] **ABSTRACT**

A machinery control panel with dial setting templates which determine particular settings of the panel dials for an error-free reestablishment of these settings. Each control panel dial has a dial head with an adjustment nose and the template has a matching aperture and recess for each dial. Only after all the dials are properly set, can the template be emplaced on the control panel so as to close a normally open safety switch which permits startup of the machinery.

6 Claims, 2 Drawing Figures





CONTROL PANEL WITH DIAL SETTING TEMPLATE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to control panels and dial setting means, and in particular to machinery control panels with multiple adjustable dials which cooperate with a dial setting template so that the machinery can only be started when a particular dial setting pattern is established on the control panel.

2. Description of the Prior Art

A preferred application of the invention is a control panel for web and film processing machinery, such as slicing machines and the like, for example.

These installations require individual adjustment of a great number of operating parameters which change with different web materials. Some of these parameters are, for instance, the web tension, the characteristics of web winding, the web width, the weight of the material, dosage of material deposit on the web, operating temperatures, and many more. The optimal machinery performance under these parameters must be adjusted at the machinery control panel. Each material and each operation thus requires a particular pattern of dial settings on the control panel. These dial settings are initially determined by trial and error and from appropriate engineering tables if available. These dial settings are then preferably recorded in tables or in a log book in order to reestablish the settings without the need of costly repeat experimentation. Thus, whenever the machinery is to be set up for a known operation, the values of the dial settings for this operation are looked up and the dials of the control panel are set accordingly. Experience has shown, however, that dial setting errors can occur nevertheless, and that these human errors may result in costly production run rejects before the error is discovered and the dial settings are corrected.

Among the prior art efforts in this field is a control panel suggested in U. S. Pat. No. 3,045,077 which discloses an electronic tube testing apparatus whose test sockets can be covered by means of a test template so that only those sockets are exposed which are required for the testing of the particular tube to which the template belongs. U.S. Pat. No. 2,924,678 teaches a device which serves a similar purpose, but where the template, when placed on the control panel, depresses contact pins, except in those places where apertures are provided in the template. The multiple contacts established by the template make possible the setting of a specific operating program, but they do not permit selective settings of multiple dials on a machinery control panel.

In the German Patent No. 901,089 is disclosed a control panel for another electronic tube testing apparatus which includes the presetting of different adjustment limits of a dial. Here, a template permits the insertion of plugs into the panel at different positions. Depending upon these positions of insertion, different linkages are actuated by the plugs which cooperate with abutment pins in the adjustment path of the dial hand of an adjustable control instrument. The adjustment range of this instrument is thus limited to a value determined by the template. This prior art device has the disadvantage of requiring complicated linkages, especially when many dials are to be preset, and it also requires the additional operation of plug insertion after emplacement

of the template. It does not permit the predetermination of specific dial settings.

SUMMARY OF THE INVENTION

It is a primary objective of the present invention to provide a machinery control panel with adjustable dials which cooperate directly with dial setting templates so as to produce a predetermined dial setting pattern with or without the possibility of additional adjustments on some of the dials. The dial setting template thus fully determines a plurality of dial settings of the control panel.

The invention proposes to attain the above objective by a machinery control panel which includes dial setting templates with apertures that match the dial heads of the control panel, the dial heads and the template forming cooperating noses and recesses which permit placement of the template over the dial heads only when the dials are adjusted to a specific setting pattern.

An additional feature of the invention suggests a safety switch in the control panel which permits startup of the machinery only when a template is in place on the control panel.

The control panel and dial setting template of the invention eliminate any human error in the dial settings, as the template can only be placed on the control panel when all dial heads are adjusted to the settings which are incorporated in the template for a particular machinery run. Any single dial head which is not adjusted to the predetermined setting or setting range makes it impossible to properly position the template on the control panel, and this in turn makes it impossible to start the machinery, because a normally open safety switch is only then closed, when the dial setting template is correctly positioned on the control panel. The safety switch has to be closed before the main switch in the main circuit becomes operative to stop and start the machinery. The dial setting template permits the presetting of the dial heads in any angular position within 360°. The cooperation between the template and the dial heads is a direct one, eliminating the need for additional mechanical elements, with the associated risk of malfunction and adjustment errors. The dial setting template as contemplated by the invention is extremely simple and inexpensive to manufacture. It can be easily adapted in shape to a variety of sizes and shapes of control panels and it requires no additional mechanisms or electrical controls on the control panel. The optimal dial settings as once determined by trial and error for each kind of material and type of processing are thus permanently incorporated in a special dial setting template. The template itself preferably carries the markings identifying the material and the process. If the machinery control panel is to be set by means of such a template, the latter is merely positioned over the dial heads and the dial heads are rotated until they are in alignment with the positions given by the template. When all the dial heads are aligned, the template can be fully lowered into place so as to close the safety switch. Once the dial setting template is thus lowered, it is no longer possible to reset the dials, except where the template has an aperture which specifically permits such an adjustment within a limited range.

With certain materials and processing parameters, it is necessary to establish in each case the same precise

pattern of dial settings, permitting not even a limited adjustment of any of the dials after placement of the template. In other cases, however, it may be desirable to provide a limited adjustment possibility on some of the dials without the need of exchanging or modifying the template. This result is accomplished in a simple manner by widening the recesses to annular segments so as to permit the movement of the cooperating notches within these segments.

The machinery control panel and dial setting templates of the invention assure a simple and reliable repetition of earlier established dial settings of any pattern. The invention has the additional advantage of being foolproof, i.e., it positively eliminates the possibility of human error on the part of the operating personnel, once the proper template has been selected, because the machinery can only be started after the dials have been correctly set and the template has been properly positioned over them.

BRIEF DESCRIPTION OF THE DRAWING

Further special features and advantages of the invention will become apparent from the description following below, when taken together with the accompanying drawing which illustrates, by way of example, an embodiment of the invention, represented in the various figures as follows:

FIG. 1 is a plan view of a control panel with a dial setting template embodying the invention; and

FIG. 2 is a partial elevational cross section along line II—II of FIG. 1, including a schematic main circuit.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 and 2 of the drawing illustrate a control panel 1 which carries a plurality of adjustment knobs 2, 3, 4, 5, 6, and 7, each knob head having on its periphery a pointed dial nose 8. The dial heads 2, etc. are rotatably mounted in panel 1. The various control elements which are associated with the dial heads or knobs 2, etc. are not shown in the drawing. Each dial head 2, etc. is surrounded by a scale 9.

In the control panel 1 is further arranged a safety switch whose plunger 11 normally protrudes from the panel surface and, when depressed, closes contact 12. The latter is normally held open by means of a spring 13 in which case switch plunger 11 is in the position shown by dotted lines in FIG. 2. The main circuit of the machinery which is to be controlled by this control panel is shown schematically in FIG. 2. It includes an electrical power supply 14 which leads to a main switch 15 via the contact 12 of the safety switch. The relays and other control circuits of the electrical controls are not shown in the drawing. A shunt circuit with a shunt switch 15 makes it possible to bypass the safety switch 11, 12 for experimental dial adjustments without dial setting templates, but this shunt switch 15 is so arranged that it can only be operated after insertion of a special key.

The dial setting template 17 is preferably made of a transparent material and has a plurality of apertures 18 which match the size and positions of the dial heads 2, etc. These apertures 18 include radial recesses 19, 20, 21, 22, 23 and 24 which match the adjustment noses 8 on the dial heads. These noses 8 are preferably pointed triangular protrusions on the periphery of the dial heads, and the notches 19, etc. are shaped as matching triangles. In the particular example of a template shown in the drawing, the recesses 19, 20, 21 and 22 are

notches that closely fit the noses 8 of the respective dial heads 2, 3, 4 and 5, thereby accurately determining a particular angular setting of these dials. The recesses 23 and 24, however, are shown to be wider than the adjustment noses 8 of their respective dial heads 6 and 7, these dials being adjustable within a limited range as determined by the annular sector of these recesses 23 and 24. In the control panel 1 are further arranged several bores 10, and the dial setting template 17 has similar matched bores 25 into which fasteners 26 can be inserted. These fasteners serve to lock the template 17 against the control panel 1. It is of course possible to lock the template against the control panel by means of several other known fastening means. It is also possible to provide a very sensitive spring 13 on the safety switch 11 so that the weight of the template alone will operate the latter and no fasteners are required.

When a particular dial setting is to be established by means of trial adjustments of the controls, it is necessary to close the shunt switch 16 in order to allow startup of the machinery by means of main switch 15, while the safety switch 11, 12 remains open. The dials 2, 3, 4, 5, 6 and 7 can now be adjusted individually until the optimal settings are found. This particular pattern of settings, being the optimal one for a material A, for example, is then reproduced in the apertures 18 of a dial setting template 17, with the recesses 19, 20, 21, 22, 23, and 24 having identical angular positions as the adjustment noses 8 of their respective dials. The template 17 then receives markings identifying it as carrying the setting pattern for material A. For different materials, or for different operations on the same material, different optimal settings may be found, and these optimal settings can be preserved in each case in a special template.

In normal operation, the shunt switch 16 remains open. When the machinery is to be set up for a particular material and operation for which a dial setting template is available, that particular template 17 is placed loosely on the control panel 1. The dial heads 2, etc. protrude sufficiently over template 17 to permit adjustment of the dials until their adjustment noses 8 are in line with the template recesses 19, etc. Only when all dial heads are aligned with their template apertures can the template 17 be fully lowered over the dial noses 8 until template 17 and panel 1 rest against one another. In this position the safety switch plunger 11 is depressed and the safety contact 12 in the main circuit is closed; the machinery can be started by closing the main switch 15. The dial setting template 17 is firmly maintained against panel 1 by means of several quick release fasteners 26.

Under certain operating conditions, it may be desirable to give the operator some means of adjustment, even when a dial setting template is installed on the control panel. As mentioned earlier, this is conveniently accomplished by providing sector-shaped recesses in the template for those dial heads which are to be adjusted.

It should be understood, of course, that the interaction between the dial heads and the apertures of the template need not be restricted to noses on the former and recesses in the latter, but it would also be possible to use different structural features such as axial grooves in the dial heads and matching protrusions in the template apertures, for example. The templates of the embodiment illustrated in the drawings, however, have the advantage that they can be conveniently prefabricated

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with circular apertures for the dial heads, the individual templates being finished by merely filing or clipping the recesses in the apertures in the desired angular alignment.

What is claimed is:

1. A control panel comprising:

means defining a generally flat panel surface;

a plurality of dial knobs protruding from said surface and being rotatable about axes perpendicular to said surface;

a template having apertures corresponding to said knobs and adapted to be placed thereover onto said surface; and

cooperating single notch and single recess means at the peripheries of corresponding knobs and apertures whereby said template may be placed over said knobs and against said panel only when each of said knobs is rotated to a predetermined orientation wherein corresponding notch and recess means are all in axial alignment.

2. A control panel as defined in claim 7 further comprising:

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a normally open safety switch which is closed by placement of the dial setting template against the panel surface.

3. A control panel as defined in claim 2, wherein the interlocking means are in the form of cooperating noses and recesses on the matching knobs and template apertures respectively.

4. A control panel as defined in claim 3, wherein the interlocking means are in the form of radially protruding pointed noses on the knobs and of matching radial recesses in the template apertures.

5. A control panel as defined in claim 3, wherein the interlocking means are in the form of radially protruding noses on the knobs and of angularly oversized radial recesses in certain template apertures, the interlocking means thus permitting a limited readjustment of the predetermined dial setting.

6. A control panel as defined in claim 7, further comprising: means for fastening the dial setting template on the panel surface.

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