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(54) Adapter device for thermocouples

(57) An adapter device to enable thermocouples with Faston type coupling to be mounted upon bodies (10) of valves or valved cocks adapted for mounting thermocouples with threaded coupling and comprising a conventional magnetic assembly (11) locked by means of a locking nut (12) and having a contact head (16), wherein said adapter device comprises : - a contact pin (24), having a front end head (25) adapted to engage the contact head (16) of a conventional magnetic assembly (11) and a rear end head (26) adapted to engage the contact head (27) of a thermocouple (28) provided with a Faston type coupling, as well as a front perimetral stop means; - an insulating bushing (29) inserted onto said contact pin (24) and having a front perimetral step formation abutted to the front perimetral stop means of said contact pin (24); - an externally threaded mounting nut (31) which is screwed within said magnet assembly locking nut (12) and pushes against said perimetral step formation of the insulating bushing.

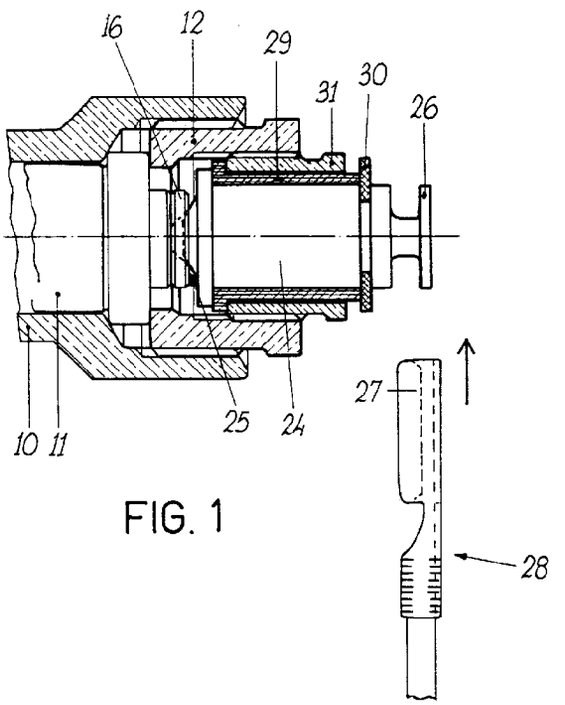

FIG. 1

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Description

This invention broadly relates to valve cocks and to gas valves and more particularly it is related to an adapter device which enables a thermocouple provided with a connector type coupling or a Faston type coupling to be mounted to a magnetic assembly as up to now employed for thermocouples provided with threaded coupling.

As it is known, only conventional magnetic assemblies adapted for use with thermocouples provided with threaded coupling have been used up to now in valved cocks or gas valves.

Presently, also magnetic assemblies adapted for use with thermocouples provided with fast couplings (that can be of the connector type or of the so-called Faston type) are known.

In some circumstances, however, for arranging cocks on cooking appliances or cooking planes having particular dimensions and shapes, or generally limited sizes, it is not possible to mount commercially available magnetic assemblies adapted for use with thermocouples provided with a threaded coupling or connector arrangements: a Faston type connector is needed in view of such dimensions. This kind of coupling device could be combined only with a specific magnetic assembly.

In effect, it is not possible to directly mount the magnetic assembly adapted for use with a commercially available thermocouple provided with a Faston type coupling to a structure having a magnet locking nut with male thread (as it can be seen in the bottom portion of Figure 4), due to the fact that the manufacturers of magnets do not manufacture magnets with a Faston type coupling having such a length as to overcome the length of a magnet locking nut. This drawback will be apparent upon considering the description of Figure 4.

It is a broad object of this invention to realize an adapter device enabling thermocouples provided with Faston type coupling to be mounted also upon conventional magnetic assemblies, as already employed for mounting thermocouples provided with a threaded coupling.

It is a further object of this invention, to realize an adapter device of the above mentioned kind, suitable for use in combination with a structure having a magnet locking nut provided with either a male thread or a female thread.

These objects are achieved by means of an adapter device that, in its preferred essential embodiment, comprises: - a contact pin, having a front end head adapted to engage the contact head of a conventional magnetic assembly and a rear end head adapted to engage the contact head of a thermocouple provided with a Faston type coupling, as well as a front perimetral stop means; - an insulating bushing inserted onto said contact pin and having a front perimetral step formation abutted to the front perimetral stop means of said contact pin; - an externally threaded mounting nut which is screwed within said magnet assembly attaching nut and pushes against said perimetral step formation of the insulating bushing.

In a first embodiment of the adapter device according to this invention, the front perimetral stop means provided upon said contact pin is formed by a perimetral projection against which the front end of said insulating bushing rests.

In a second embodiment of the adapter device according to this invention, the front perimetral stop means provided upon said contact pin is formed by a perimetral groove wherein a spring safety stop ring is arranged in order to cooperate with a washer so as to realize a perimetral abutment against which the front end of said insulating bushing rests.

Further details, particulars and advantages of this invention will be apparent from the following description by referring to the enclosed drawings wherein the above mentioned embodiments are shown by way of illustration and not by way of limitation.

In the drawings:

Figure 1 shows a cross-section view of a valve body provided with an adapter device according to this invention, in a first embodiment, for application of a thermocouple with Faston type coupling;

Figure 2 shows a cross-section view of a valve body as in Figure 1, provided with an adapter device according to this invention, in a second embodiment;

Figure 3 shows a cross-section view of a valve body provided with a magnet locking nut having a female thread and with an adapter device according to the first embodiment;

Figures 4A and 4B show cross-section views of valve bodies of standard production provided with conventional magnetic assemblies, adapted to receive a thermocouple having a threaded or screw coupling.

By referring now to Figures 4A and 4B, two embodiments according to the prior art are shown, which are different from one another only in respect of the screw threaded nut by means of which the magnetic assembly is mounted within the cock body. In figures 4A and 4B, it is possible to observe the cock body 10, wherein a conventional magnetic assembly 11 is housed and locked by means of a screw threaded nut 12: the embodiments as shown in Figures 4A and 4B are different from are another only in respect of the thread type between the cock body 10 and the locking nut: in fact, the thread type is male-female in the first embodiment and female - male in the second embodiment. In other aspects, the concerned two embodiments are perfectly equivalent.

An axial internally threaded hole is provided in locking nut 12, wherein a thermocouple 13 is screwed, said thermocouple being of the screw type coupling. Said

thermocouple has a head 14 which is electrically insulated with respect to its body 15 and, upon being tight screwed, it is engaged with head 16 of the magnetic assembly 11.

Those skilled in the art will understand that only thermocouples provided with screw or threaded coupling can be engaged with a structure of this kind, it will not be possible to engage thermocouples provided with a Faston type coupling.

Subject-matter of this invention is an adapter device adapted to enable thermocouples provided with a Faston type coupling to be mounted also upon cock bodies provided with standard magnet assemblies, upon which it was up to now possible to mount only thermocouples provided with screw coupling.

By referring to Figure 1, an embodiment of the adapted device is shown suitable for use with cock bodies having the magnetic assembly locking nut provided with male thread. A cock body 10 can be observed in the Figure, wherein a conventional magnetic assembly 11 is housed and locked by means of a locking nut 12. In this embodiment, the cock body 10 is realized as a socket with internal female thread, while locking nut 12 for locking said magnetic assembly 11 is provided with a male thread.

The concerned adapter device per se comprises, as essential component, a contact pin 24, having a front end head 25 adapted to contact the head 16 of a magnetic assembly 11 suitable for use with a thermocouple provided with a screw coupling, as well as a rear end head 26, adapted to engage the head 27 of a thermocouple 28 having a Faston type coupling.

Contact pin 24 has a front perimetral step formation upon which rests an insulating bushing 29 which is held stationary by means of a spring ring 30 engaged within a perimetral groove provided in the rear end of pin 24. Also said insulating bushing 29 has a front perimetral step formation with which an externally threaded locking nut 31 is engaged. Said locking nut 31 is screwed into the internal thread of locking nut 12 used to lock said magnetic assembly 11. It is believed convenient to underline that, even if it should now be apparent, not only the above described adapter device can be screwed into said locking nut 12, but also a thermocouple provided with a conventional screw coupling can be screwed thereinto.

It should also to be mentioned that the stop ring 30, which can be of the well known Seeger or any other type, carries out no specific and essential function is this system; it is only to be used to assemble components 24, 29 and 31 and to aid mounting said locking nut 31. Spring ring 30, therefore, can be omitted or substituted by other analogous devices.

By referring now to Figure 2, a further embodiment of this adapter device is shown. This embodiment is different with respect to the embodiment of Figure 1 in that contact pin 24 has a perimetral groove near its front end, wherein a spring safety or stop ring 30 is engaged. This safety ring 30, which may be realized as a well known Seeger ring or like, carries out the same function as in the embodiment of Figure 1; however, in this case, this ring 30 cannot be omitted, because it also acts as a stop shoulder for washer 32.

The attention should also be directed to insulating bushing 29 and to locking nut 31, perfectly corresponding to analogous items shown in Figure 1 and operating in the same way, in order to establish a coupling between the head 16 of a conventional magnetic assembly and a thermocouple provided with a Faston type coupling.

By referring to Figure 3, an adapter device is shown corresponding to the embodiment of Figure 1, but it is mounted upon a cock body 10A wherein a conventional magnetic assembly 11 is locked by means of a locking nut 12A provided with an internal female thread. The component of this adapter device are identical to and identically operating as the components of the embodiment shown in Figure 1.

In all above described Figures, identical or like component, carrying out similar functions have been designated by the same or similar reference numerals.

The preferred embodiments of this invention have been described and a number of variations have been suggested hereinbefore, but it should expressly be understood that those skilled in the art can make other variations and changes, without so departing from the scope thereof, as defined by the annexed claims

Claims

1.- An adapter device to enable thermocouples with Faston type coupling to be mounted upon bodies (10) of valves or valved cocks adapted for mounting thermocouples with threaded coupling and comprising a conventional magnetic assembly (11) locked by means of a locking nut (12) and having a contact head (16), characterized in that said adapter device comprises:

- a contact pin (24), having a front end head (25) adapted to engage the contact head (16) of a conventional magnetic assembly (11) and a rear end head (26) adapted to engage the contact head (27) of a thermocouple (28) provided with a Faston type coupling, as well as a front perimetral stop means;

- an insulating bushing (29) inserted onto said contact pin (24) and having a front perimetral step formation abutted to the front perimetral stop means of said contact pin (24);

- an externally threaded mounting nut (31) which is screwed within said magnet assembly locking nut (12) and pushes against said perimetral step formation of the insulating bushing.

2.- An adapter device according to claim 1, characterized in that said the front perimetral stop means provided upon said contact pin (24) is formed by a perimetral projection against which the front end of said insulating bushing (29) is abutted.

3.- An adapter device according to claim 1, characterized in that said front perimetral stop means provided upon said contact pin (24) is formed by a perimetral groove wherein a spring safety stop ring (30) is arranged in order to cooperate with a washer (32) so as to realize a perimetral abutment against which the front end of said insulating bushing (29) is abutted.

4.- An adapter device according to claim 1, characterized in that said contact pin (24) is provided at its rear end with a perimetral groove within which a spring stop ring is engaged in order to assemble said contact pin (24), said insulating bushing (29) and said locking nut (31).

5.- An adapter device according to any one of the preceding claims, characterized in that said cock body (10) and said locking nut (11) for locking said magnetic assembly (11) are coupled by means of a male - female or a female - male threaded coupling, respectively.

6.- An adapter device according to any one of the preceding claims, characterized in that said spring stop rings are made by Seeger or like type rings.

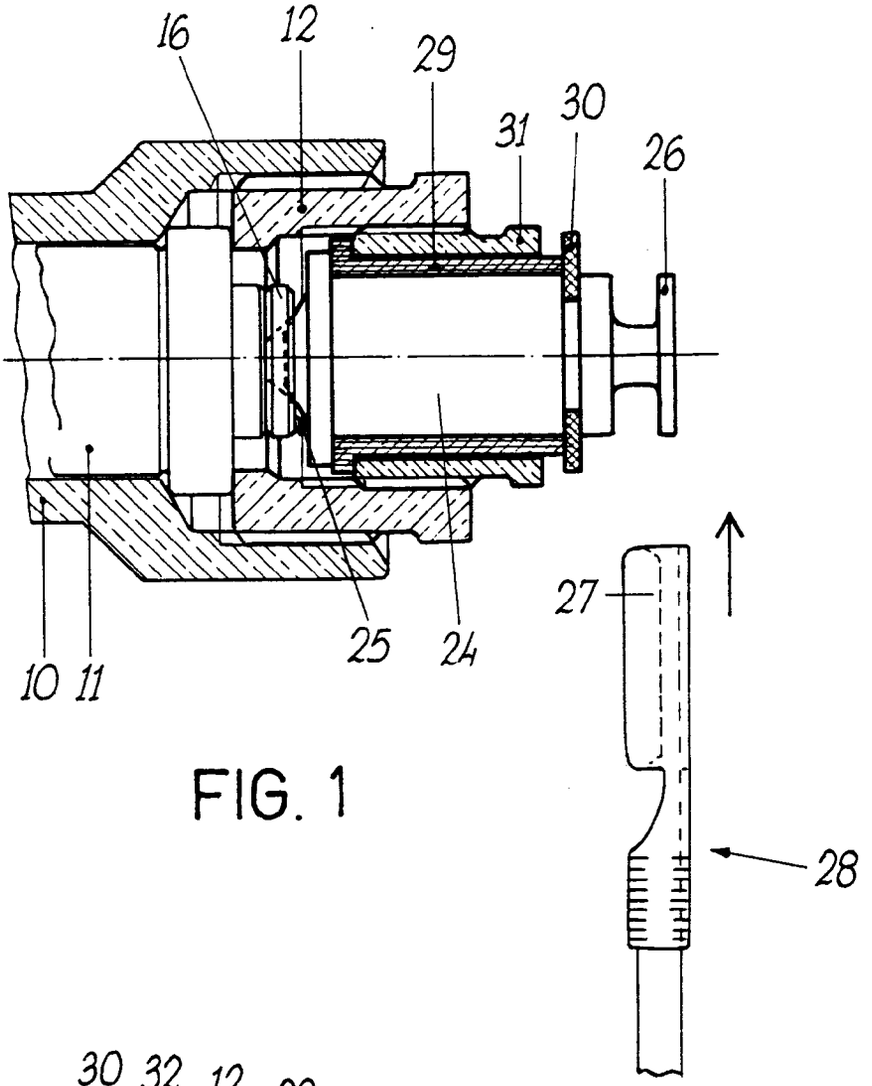

FIG. 1

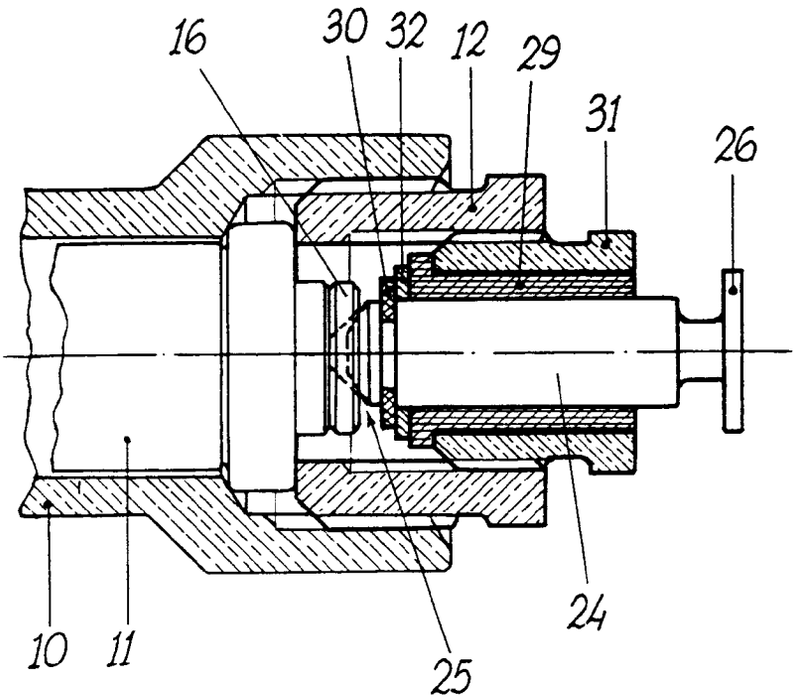

FIG. 2

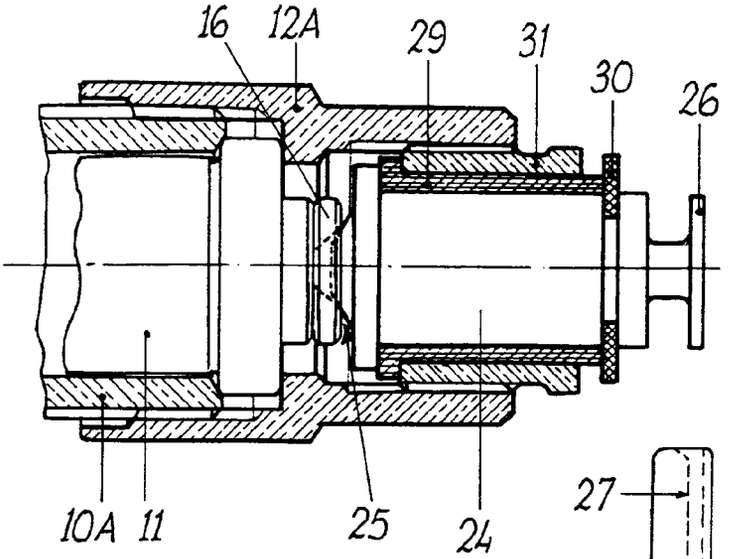

FIG. 3

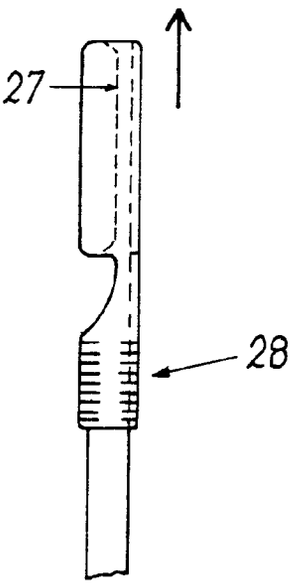

FIG. 4B

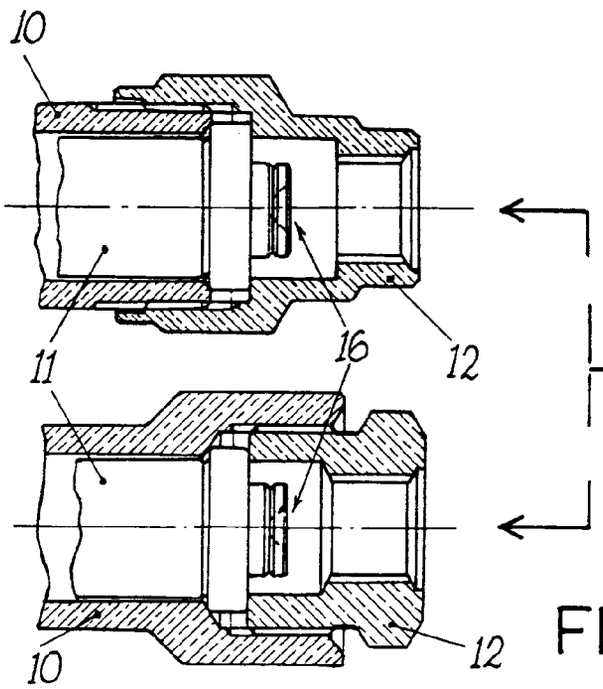

FIG. 4A

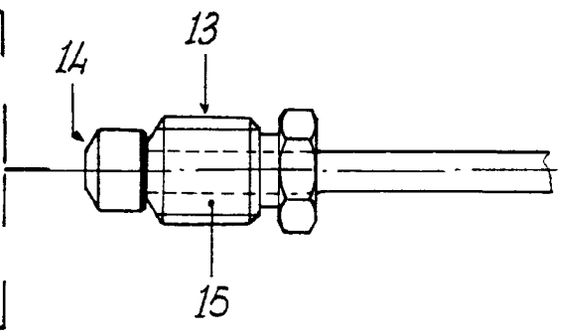

FIG. 4C

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EUROPEAN SEARCH REPORT

Application Number
EP 95 83 0273

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
P,A	EP-A-0 619 460 (ORKLI S. COOP. LTDA.) * figures 1,2 *	1	F23N5/10
A	FR-A-2 696 531 (BOSCH) * figures 2,3 *	1	
A	EP-A-0 433 528 (ISPHORDING METALLWERKE) * figure 1 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

F23N
F23D
F24C
F16K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	15 September 1995	Schlabbach, M

CATEGORY OF CITED DOCUMENTS

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