Jan. 9, 1934. H. N. PACKARD 1,942,519

PYROMETER

Filed May 29, 1930

Fig. 1

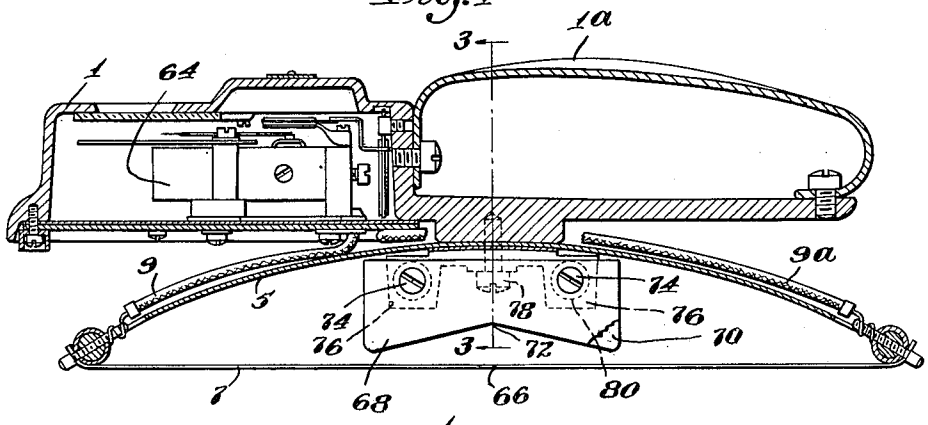
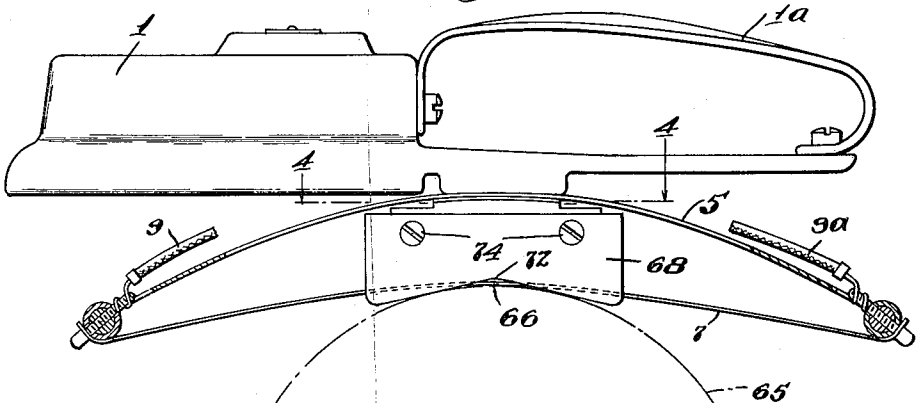


Fig. 2.



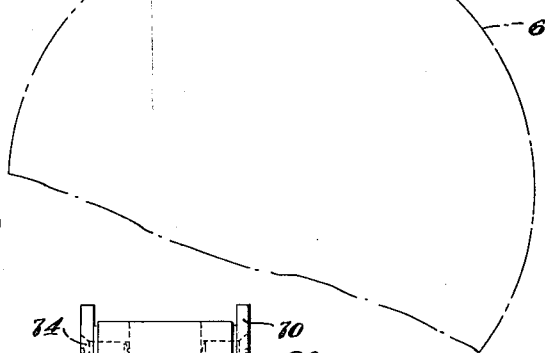
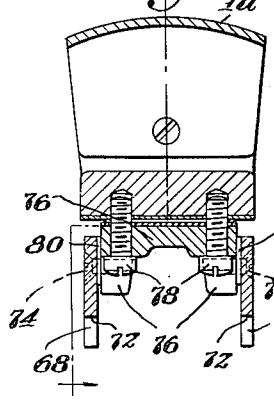


Fig. 3.



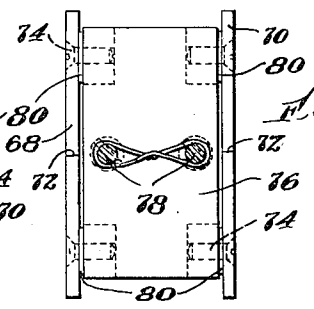


Fig. 4.

Inventor
H.N. Packard

by David Rines
Attorney

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UNITED STATES PATENT OFFICE

1,942,519

PYROMETER

Horace Nelson Packard, Ossining, N. Y., assignor to The Cambridge Instrument Company, Inc., Ossining, N. Y., a corporation of New York

Application May 29, 1930. Serial No. 456,832

2 Claims. (Cl. 73—32)

The present invention relates to temperature-measuring instruments, and more particularly to surface pyrometers of the type illustrated and described in Letters Patent of Great Britain, No. 248,301.

The nature and the objects of the invention will be explained more fully in connection with the accompanying drawing, in which Fig. 1 is an elevation, partly in longitudinal section, and with parts broken away, of a surface pyrometer constructed according to a preferred embodiment of the present invention; Fig. 2 is a similar view, showing the instrument applied to a dryer roll; Fig. 3 is a section taken upon the line 3—3 of Fig. 1, looking in the direction of the arrows, parts being omitted for clearness; and Fig. 4 is a similar section, taken upon the line 4—4 of Fig. 2, looking in the direction of the arrows.

A thin, sensitive, thermo-couple strip 7 is shown consisting of two thin, thermo-couple strips of dissimilar metals, joined together end to end at the center 66 by welding or soldering to produce a thermo-couple junction. The ends of the resulting thermo-couple strip 7 are secured to the ends of a flat, steel, spring strip 5, intermediately secured to the underside of a handle 1*a*. As the thermo-couple strip 7 is shorter than the spring strip 5, the latter becomes bent into arcuate form and the former becomes stretched into flat condition. Suitably insulated leads 9 and 9*a* connect opposite ends of the thermo-couple strip 7 to a millivoltmeter or other indicating instrument 64 in a casing 1.

In operation, the pyrometer is held by the handle 1*a* and the thermo-couple strip is pressed, at the intermediate, junction point 66, against the object the temperature of which it is desired to measure. This object has usually a rounded or cylindrical surface,—say, a heated dryer roll 65. By reason of the pressure of the strip 7 against the roll, the strip 7 becomes deflected or bent, very much like the string of a bow, thus making good, firm thermal contact between the surface of the roll and the thermo-couple joint 66. The instrument may be used on rolls 65 of different diameter.

But too heavy pressure causes excessive wear and the generation of an undue amount of frictional heat. Too light a pressure, on the other hand, may not yield a sufficiently good contact. There is danger, too, of the strip 7 being applied carelessly to the object, to one side of the thermo-couple joint 66, thus producing no contact at all. Errors in readings of the instrument 64 are thus introduced.

According to a preferred embodiment of the present invention, these difficulties are overcome by the provision of suitable guide plates 68 and 70 for guiding the operator to apply the strip 7 properly, and with suitable tension, to the dryer roll or other object. The guides 68 and 70 are preferably disposed, one on each side of the strip 7. Preferably, as shown at 72, the guides are V-shaped, the vertices of the two V's being substantially in the same central transverse plane of the instrument as the thermo-couple junction 66. When the instrument is forced down upon the dryer roll 65, it becomes automatically guided to the central position, with the junction 66 contacting snugly and surely against the roll 65; and the depths of the V's may be so designed as to give just the proper tension on the strip 7 when the V-shaped guides contact with the roll 65, as illustrated in Fig. 2.

According to the specific embodiment of the invention that is herein illustrated, the guides 68 and 70 are secured by screws or other fastening members 74 to a support 76, shown as a supporting plate, in the form of a casting, that is centrally secured to the underside of the frame or handle 1*a* by screws 78. For low-temperature work, vulcanized fibre or other low-heat conductive material may be employed; for high-temperature work, steel or nichrome plates or other low-heat-conductivity metals. It is desirable to avoid the conduction of heat from the object 65 to the instrument 64, and also to the operator's hand, the former to avoid instrumental reading errors, and the latter for comfort. The plates 68 and 70 may, therefore, be suitably heat-insulated from the support 76 by asbestos washers 80.

Modifications will obviously occur to persons skilled in the art, and all such are considered to fall within the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. A pyrometer comprising a flexible thermo-couple strip supported at two points and adapted to contact with a convex surface of an object the temperature of which is to be measured at an intermediate point in response to pressure exerted at the two points toward the object, and a V-shaped guide mounted on each side edge of the thermo-couple strip for centering the thermo-couple strip on the object and ensuring a firm contact pressure between the thermo-couple strip and the object.

2. A pyrometer comprising a handle, a flat spring intermediately secured to the handle and

bent into arcuate form, a flexible thermo-couple strip the ends of which are secured to the ends of the spring, an intermediate portion of the thermo-couple strip being adapted to contact flexibly with a convex surface of an object the temperature of which is to be measured in response to pressure exerted by the handle on the thermo-couple strip towards the object, and a V-shaped guide mounted on each side edge of the thermo-couple strip for centering the thermo-couple strip on the said object and ensuring a firm contact pressure between the thermo-couple strip and the object.

HORACE N. PACKARD.