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LERNER GREENBERG STEMER LLP
P O BOX 2480
HOLLYWOOD, FL 33022-2480

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CRUM, JACOB R	

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte WOLFGANG ULLERMANN and HELMUT KRAUS

Appeal 2019-000525
Application 13/849,745
Technology Center 2800

Before JEFFREY T. SMITH, BEVERLY A. FRANKLIN, and MICHAEL G. McMANUS, *Administrative Patent Judges*.

McMANUS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–18. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

[1] We use the word "Appellant" to refer to "Applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Ellenberger & Poensgen GmbH. Appeal Br. 1.

BACKGROUND

The pending application "relates to a miniature safety switch for use in motor vehicle electronics." Spec. ¶ 2. Miniature safety switches are sometimes used in place of fuses in the automotive industry. *Id.* ¶ 3. These switches employ a bimetallic snap disk as a trigger mechanism. *Id.* ¶ 4. Bimetallic snap disks change position suddenly in response to changes in temperature. *Id.* In normal operation, electricity passes through the bimetallic snap disk and through a pair of contacts. *Id.* "As soon as the temperature prevailing in the safety switch exceeds the temperature threshold value as a result of an overcurrent, the bimetallic snap disk suddenly changes its shape, whereby the moving contact is lifted from the fixed contact and the current path is thus disconnected." *Id.*

The miniature safety switch further includes a PTC (positive thermal coefficient) resistor. The PTC resistor is arranged in conjunction with a compression spring so that the PTC resistor remains in contact with the bimetallic snap disk when it is triggered. *Id.* ¶ 16. When the safety switch is in an open (nonconductive) position, a current passes through a PTC resistor and the resistor is heated. *Id.* This heat from the PTC resistor prevents the bimetallic disk from returning to its prior position. *Id.* ¶ 17.

Figures 6 and 7 of the Application are reproduced below.

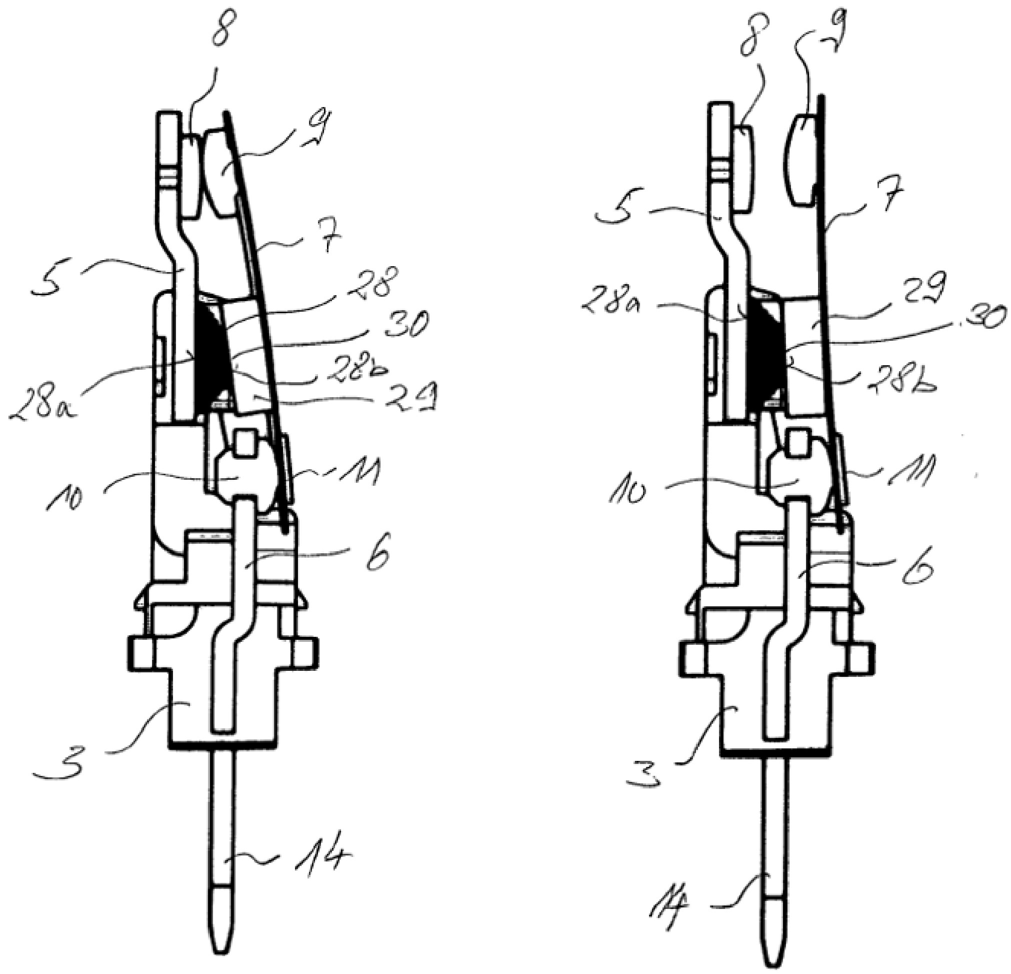

Figure 6 (left) is a side view of a safety switch in an electrically conductive state. *Id.* ¶ 28. Figure 7 (right) is a side view of a safety switch in a triggered (nonconductive) state. *Id.* ¶ 29. In the conductive state (left) fixed contact 8 and moving contact 9 are in contact. In the nonconductive state (right) fixed contact 8 and moving contact 9 are not in contact. Spring 28 exerts a force upon the PTC resistor 29 so that it stays in contact with the bimetallic snap disk in both configurations. The Specification teaches that "the conical spring contacts the PTC resistor 29 as centrally as possible, where it forms a central tilt point 30." *Id.* ¶ 41.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

> 1. A miniature safety switch for use in motor vehicle electronics, comprising:
>
> a housing having a housing base made of an insulating material and a housing cover that can be fitted, or is fitted, on said housing base;
>
> first and second elongate and flat contact arms disposed parallel to one another in terms of a longitudinal direction, disposed in said housing base and being led at a base side from said housing base, said second contact arm having an second contact arm inner end in said housing opposite said base side;
>
> a fixed contact disposed in said housing and attached to said first contact arm;
>
> a moving contact for contacting said fixed contact;
>
> a bimetallic snap disk affixed to said second contact arm at said
>
> second contact arm inner end, said bimetallic snap disk spanning from said second contact arm inner end to said fixed contact and carrying said moving contact thereon in a position for contacting said fixed contact and connecting said first contact arm to said second contact arm;
>
> **a separate compression spring supported on said first contact arm beneath said fixed contact in the longitudinal direction**; and a PTC resistor being electrically incorporated such that, as a result of heat generated by said PTC resistor, said bimetallic snap disk remains in an open position thereof in an event of triggering, **said PTC resistor being brought into direct contact with said bimetallic snap disk by means of said separate compression spring**.

Appeal Br. 22–23 (Claims App.) (emphases added).

REJECTIONS

The Examiner maintains the following rejections:

1. Claims 1–13, 16, and 18 are rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Furukawa (US 5,607,610, issued Mar. 4, 1997) in view of Yamashita et al. (US 5,078,115, issued Jan. 7, 1992) ("Yamashita"). Final Act. 2–11.
2. Claims 14 and 15 are rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Furukawa in view of Yamashita and Cenky (US 4,808,965, issued Feb 28, 1989). *Id.* at 12.
3. Claim 17 is rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Furukawa in view of Yamashita and Cenky. *Id.* at 13–18.

DISCUSSION

Rejection 1. The Examiner rejects claims 1–13, 16, and 18 as obvious over Furukawa in view of Yamashita. *Id.* at 2–11. Each of these claims depends from claim 1, directly or indirectly. Appeal Br. 22–29 (Claims App.). Appellant presents argument limited to certain limitations of claim 1 (and claim 17, rejected separately). *Id.* at 9–19. Accordingly, pursuant to 37 C.F.R. § 41.37(c)(1)(iv), we confine our discussion to appealed claim 1.

The Examiner finds that Furukawa teaches all elements of claim 1 other than "a separate compression spring supported on said first contact arm beneath said fixed contact in the longitudinal direction" and "said PTC resistor being brought into direct contact with said bimetallic snap disk by means of said separate compression spring." Final Act. 3. Figures 3 and 4 of Furukawa are reproduced below.

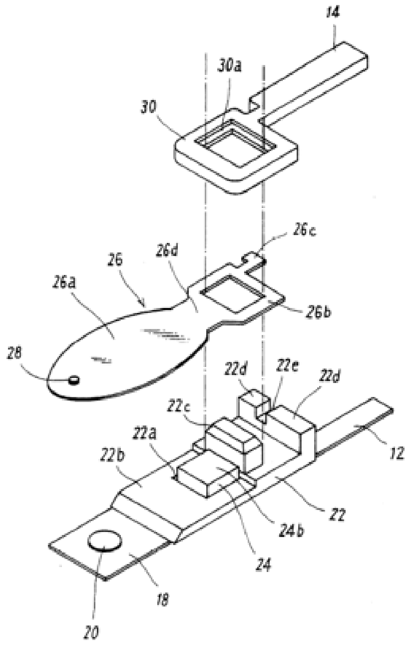

Fig. 3

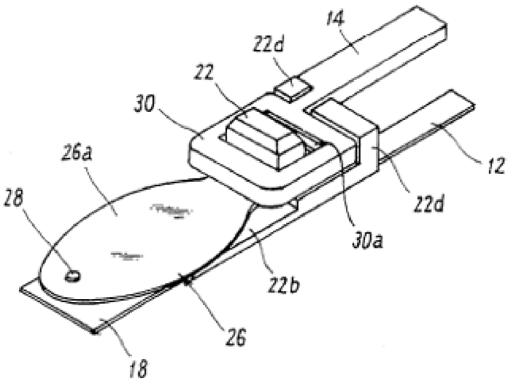

Fig. 4

Figure 3 (left) is an expanded view of a portion of the device of Furukawa. Furukawa, 2:45–46. Figure 4 (right) shows the device in an intermediate assembled state. *Id.* at 2:49–50. The Figures show movable electrode 26 which includes bimetallic member 26a. *Id.* at 3:58–59. Furukawa teaches as follows regarding the operation of the device:

> In the normal original state, bimetal 26*a* of the movable electrode 26 holds movable contact 28 in electrical contact engagement to fixed contact 20. The electric current that flows from the terminal 14 in this original state to terminal 12 passes through the frame-shaped holding part 30, the frame-shaped engagement part 26*b* of the movable electrode 26, the base 26*d* and the bimetal part 26*a*, the movable contact 28, the fixed contact 20 and the fixed electrode 18.
>
> When the electric current starts flowing, bimetal 26*a* is heated mainly by its own resistance heating and to a much lesser extent by the resistance heating of the conductors around it, in

> addition to the heat it receives from the motor coils through casing 10. Despite such heating, the bimetal part 26*a* remains at its original position with the contacts in the closed state unless the temperature reaches an action temperature due to an overcurrent and/or overheat condition so that the electric current flows between both electrodes 18 and 26 with no substantial electric current flowing through the PTC element 24 and thus the element is scarcely heated.
>
> When the action temperature is reached due to heating by an overcurrent or by the heating of the load, the bimetal element 26*a* is displaced and snaps so that its tip is elevated, as is shown in FIG. 2. Because of the displacement of the bimetal part 26*a*, the movable contact 28 becomes separated from the fixed contact 20, thereby bringing about an open contact state which stops the flow of current between the contacts.
>
> With the contacts in the open state in this manner, the voltage between both electrodes 18 and 26 is impressed to PTC element 24 and it starts to conduct electricity with a result that heating takes place. By proper choice of characteristics for PTC element 24, it will function as a fixed temperature heater. Due to the device design, the heat from the PTC element 24 is effectively all transmitted to the bimetal part 26*b*.
>
> The heating of PTC element 24 as described above results in the bimetal 26*a* element being held at the displaced position and the two contacts 20 and 28 are maintained in the state of being separated from each other.

Id. at 4:57–5:28.

The Examiner further finds that Yamashita "suggests that it is known to provide a separate compression spring 5 (Fig. 1) between a PTC resistor 4 (col. 3, lines 21-26) and an electrically conducting contact 7, in order to provide a selected contact pressure (col. 3, lines 40-43)." Final Act. 3.

Figure 1 of Yamashita is reproduced below.

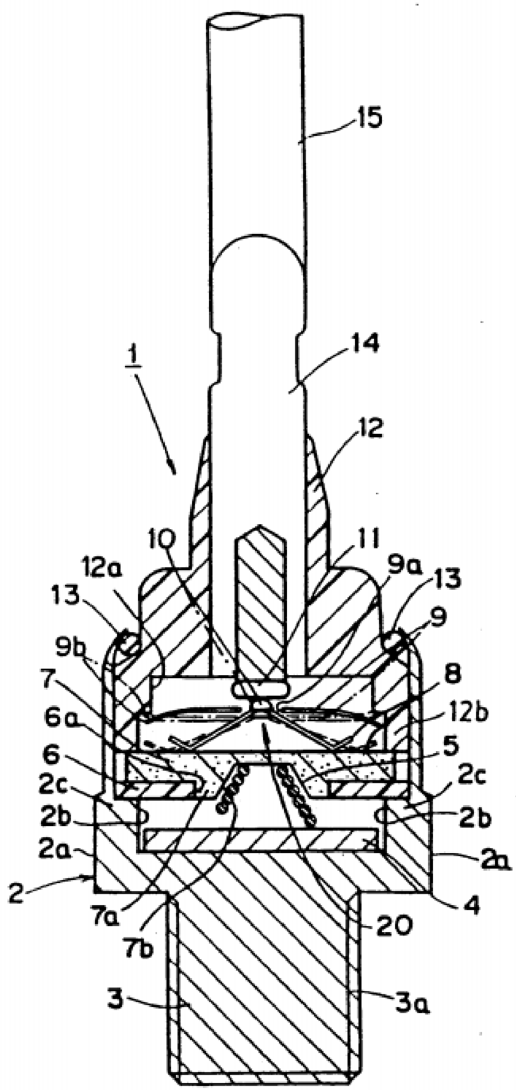

Figure 1 is a cross-sectional view of a heating device. Yamashita, 3:66–67. It shows disc-shaped heating element 4, conductive spring 5, insulating plate 6, conductive plate 7, and tripod spring 8, as well as movable contact 10 and stationary contact 11. *Id.* at 3:21–32, 3:44–56.

The Examiner finds that one of skill in the art would have had reason to combine the teachings of the references as proposed "in order to provide a selected contact pressure between the PTC resistor and the bimetal 26 [of Furukawa]." Final Act. 4.

In the Answer, the Examiner asserts that Yamashita teaches to "provid[e] a separate compression spring 5 (Fig. 1) between a PTC resistor 4 (col. 3, lines 21–26) and an electrically conducting contact 7, in order to provide a selected contact pressure (col. 3, lines 40–43) between the PTC resistor and the contact." Answer 4. The Examiner then determines as follows:

> Placing a spring between the first contact arm 18/12 and the PTC resistor 24 of Furukawa would similarly provide a selected contact pressure between the PTC resistor and the bimetal snap disk (as recited in the previous Office Action), and would further provide a selected contact pressure downward between the PTC resistor and the first contact arm through the spring. Thus, there is explicit motivation, gleaned only from the secondary reference, for the modification of Furukawa, and the modification of Furukawa meets the claimed limitation "said PTC resistor being brought into direct contact with said bimetallic snap disk by means of said separate compression spring", even though neither reference discloses the claimed limitation alone.

Id. (emphasis omitted).

Appellant makes a number of arguments asserting error in the rejection. Appeal Br. 9–19. First, Appellant argues that Yamashita does not teach a spring disposed for bringing a PTC resistor into direct contact with a bimetallic snap disk. *Id.* at 10. Appellant argues that the PTC resistor 4 (below the spring 5) as well as conductive plate 7 (above the spring) are both taught to be fixed in place. *Id.* As a result, Appellant argues, "the result alleged by the examiner cannot and does not follow from a modification of Furukawa based upon the disclosure of Yamashita." *Id.*

Second, Appellant argues that Furukawa teaches a fixed connection between movable electrode 26 and PTC resistor 24. *Id.* at 11–12.

Specifically, Appellant argues, Furukawa teaches that the PTC resistor is fixedly bonded to the bimetallic disk such that there would have been no need for a spring mechanism to hold the PTC resistor in contact with the disk. *Id.*

Third, Appellant argues that the Examiner's proposed modification would render Furukawa unsatisfactory for its intended purpose. *Id.* at 13–17. Appellant argues that Furukawa "contains a great deal of explicit disclosure pertaining to the structure, disposition, and function of the PTC element . . . which is the core of Furukawa." *Id.* at 14. Appellant further argues that the proposed modification "would jeopardize guaranteeing a stable and accurate contact opening and closing Action." *Id.* at 16. (emphasis omitted).

Fourth, Appellant argues that Furukawa teaches away from the use of a spring as follows:

> Moreover, **there is no need to provide for an electroconductive spring** between the two electrodes 18 and 26, with a result that it becomes possible to construct a thinner rigid assembly with a smaller number of parts, thereby reducing the size and thickness of the device as a whole including the casing 10.

Furukawa 5:58–63 (emphasis added).

We are persuaded that the Examiner's determination is in error. The proposed modification would yield a structure with duplicative mechanisms for maintaining contact between the PTC resistor and the bimetallic member of Furukawa. The Examiner has not articulated a persuasive rationale why one of ordinary skill in the art would have reason to combine the teachings as proposed. Further, the Examiner relies upon Yamashita's teaching of a spring that imparts "contact pressure." Answer 4. The "contact pressure" applied by spring 5 of Yamashita, however, is pressure sufficient to maintain the spring in contact with the PTC resistor 4 fixed below and the conductive plate 7 fixed above. *See* Yamashita 3:40–43; Figs 1, 4. Yamashita does not teach that spring 5 maintains any other components in contact (as required by the proposed combination). Accordingly, a person of ordinary skill in the art would not have been led to the Examiner's proposed combination. Further, Furukawa teaches that there is no need for a spring between the electrodes. Indeed, Furukawa regards the absence of a spring as advantageous. Whether or not this rises to the level of a "teaching away," it suggests that one of ordinary skill in the art would not have regarded a spring-based mechanism as desirable.

Accordingly, Appellant has shown error in the rejection of claim 1. As a consequence, Appellant has additionally shown error in the rejection of claims 2–16 and 18 which depend (directly or indirectly) from claim 1.

Rejections 2 and 3. The Examiner rejects claims 14 and 15 (Rejection 2) and claim 17 (Rejection 3) as obvious over Furukawa, in view of Yamashita and Cenky. Final Act. 12–18. Appellant relies upon the same arguments presented in regard to claim 1 (claims 14 and 15 depend from claim 1; independent claim 17 includes the same limitations at issue above). Appeal Br. 19–20. As we have found such arguments to be persuasive, we determine that Appellant has shown error in the rejection of claims 14, 15, and 17.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1–13, 16, 18	§ 103, Furukawa, Yamashita		1–13, 16, and 18
14, 15	§ 103, Furukawa, Yamashita, Cenky		14, 15
17	§ 103, Furukawa, Yamashita, Cenky		17
Overall Outcome			1–18

REVERSED