The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte JAMES L. ZAHNEN

Appeal No. 2005-1571
Application No. 10/263,275

ON BRIEF

Before MCQUADE, NASE, and BAHR, Administrative Patent Judges.
MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

James L. Zahnen appeals from the final rejection (mailed October 15, 2003) of claims 1 through 6 and 8 through 37, all of the claims pending in the application.

THE INVENTION

The invention relates to slip-fit electrical connectors for electrical power transformers and to methods for making same. Representative claims 1 and 34 read as follows:

1. A slip-fit electrical connector compatible with different size threaded transformer studs and comprising:
a body having a plurality of transverse conductor receiving passageways therein, and a plurality of conductor fastener receiving passageways therein intersecting respective transverse conductor receiving passageways;

a plurality of conductor fasteners in respective conductor receiving passageways;

said body also having a multi-size transformer stud receiving passageway extending inwardly from an end thereof, and at least one stud fastener receiving passageway therein intersecting the multi-size transformer stud receiving passageway; and

at least one stud fastener in the at least one stud fastener receiving passageway;

the multi-size transformer stud receiving passageway being defined by a smooth arcuate bottom, and a plurality of successively larger threaded stud landings with a lowermost threaded stud landing being bifurcated by the smooth arcuate bottom, and each successive threaded stud landing being bifurcated by a prior threaded stud landing, the threaded stud landings being compatible with different size threaded transformer studs.[1]

34. A method for making a slip-fit electrical connector for a threaded transformer stud comprising:

forming, in a body, a plurality of transverse conductor receiving passageways, and a plurality of conductor fastener receiving passageways intersecting respective transverse conductor receiving passageways;

forming, in the body, a transformer stud receiving passageway extending longitudinally inwardly from an end thereof [by drilling] at least one bore and forming at least one set of threads along surfaces of the at least one bore using helical interpolation; and

forming, in the body, at least one stud fastener receiving passageway intersecting the transformer stud receiving passageway.[2]

---

[1] Considered in light of the underlying disclosure, the recitations in independent claims 1 and 13 of the conductor fasteners would more be more accurate if they defined the locations of the fasteners as being in the conductor fastener receiving passageways rather than in the conductor receiving passageways.

[2] In the event of further prosecution before the examiner, claim 34 should be amended to include the bracketed wording shown above to correct an evident typographical omission. Steps also should be taken to correct (1) the lack of foundation in claim 8 for the recitation of a "second" radius of

(continued...)

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Kraft	4,214,806	Jul. 29, 1980
Ashcraft et al. (Ashcraft)	6,579,131	Jun. 17, 2003

THE REJECTION

Claims 1 through 6 and 8 through 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ashcraft in view of Kraft.

Attention is directed to the brief (filed April 22, 2004) and answer (mailed June 22, 2004) for the respective positions of the appellant and examiner regarding the merits of this rejection.

DISCUSSION

I. The merits of the examiner's rejection

Ashcraft, the examiner's primary reference, discloses "a slip-fit transformer stud electrical connector, and more particularly, a connector which accommodates in the same slip-fit

---

[2](...continued)
curvature due to the absence of any preceding recitation of a "first" radius of curvature and (2) the lack of antecedent basis in claim 22 for the recitation of "the arcuate top."

hole two different transformer stud sizes" (column 1, lines 6 through 9). The connector 10, conventionally made of aluminum, includes an upper tier portion 14, a lower tier portion 15, horizontal port openings 17-20, 22 and 23 for receiving conductors, tapped holes 26-29, 32 and 33 intersecting respective port openings for receiving jam screws to clamp the conductors in place, a blind hole 38 for slip-fit connection to the stud 11 of a transformer 12, and tapped holes 50 and 51 intersecting the blind hole for receiving jam screws 52 and 53 to clamp the stud within the blind hole. Noting that transformer studs typically come in two sizes, Ashcraft provides the blind hole 38 "with circumferential arc recesses which are sized and threaded to match the threads on the two different size studs" (Abstract). In this regard, Ashcraft teaches that

> the hole 38 is formed by a primary, secondary and tertiary drilling step on three different centers shown at 40, 41 and 42. The centers as seen in FIG. 4 are vertically aligned and yet spaced. The drill or diameter on each center also varies with the diameter on the upper center 40 being the largest. The intermediate center 41 has an intermediate diameter, and the bottom or lower center 42 has the smallest diameter.
>
> Typically, stud sizes may be either 5/8" or 1" and the intermediate and smaller lower diameter are designed to accommodate these stud sizes. . . . The largest arc shown at the top at 45 forms the majority of the wall of the hole and is unthreaded. The intermediate diameter forms two smaller circumference

> arcs shown at 46 and 47 which are positioned symmetrically on each side of the lowermost circumference arc 48 formed by the center 42. Only the smaller circumference arcs 46, 47 and 48 are threaded. The arcs 46 and 47 are provided with threads which match the threads on the larger or 1" stud. The smaller circumference arc at the center bottom indicated at 48 is provided with threads which match the smaller or 5/8" stud, for example. The edge of the entire hole is chamfered as indicated at 49 in FIGS. 2 and 3.
>
> . . .
>
> The larger circumference being unthreaded permits the connector quickly to be slipped over the threaded stud regardless of size with the jam screws retracted. As illustrated in FIGS. 5 and 6, the tightening of the jam screws will clamp the larger stud seen at 55 against the threaded circumference arcs 46 and 47 symmetrically on each side of the circumference arc 48. Since the threaded portions of the circumference arcs 46 and 47 match the threads on the stud 55, the tightening of the jam screw provides a large surface area of precision contact between the connector and the stud threads.
>
> For the smaller studs such as seen at 56 in FIG. 5, the jam screws are simply tightened down further to press the stud into the circumference arc 48 or cusp which intersects the arcs 46 and 47 to provide the intimate contact between the threads of the stud 56 and the internal threads on the arc 48. With the same blind hole, the connector may readily be connected to either size stud, and with the meshing matching threads, a large surface area of precision contact is provided which provides both a stable connection and an efficient cool running and long service life connection [column 4, line 18, through column 5, line 8].

As conceded by the examiner (see pages 3 and 4 in the answer), Ashcraft does not meet the limitations in independent claim 1, or the corresponding limitations in independent claims

13, 18 and 26, requiring the multi-size transformer stud receiving passageway to be defined in part by a smooth or unthreaded arcuate bottom which bifurcates a lowermost threaded stud landing. To overcome this deficiency, the examiner turns to Kraft.

Kraft, which is acknowledged as prior art by Ashcraft (see column 1, lines 51 through 55), discloses a transformer stud electrical connector 20 having an over-sized threaded aperture 40 designed to be slid over a threaded transformer stud 38 and clamped thereto by a set screw 42. The configuration of the aperture 40 ensures a secure connection with the stud 38:

> [t]o facilitate stability of the locking interengagement, aperture 40 is provided with a U-shaped groove or recess 54 formed in its bottom portion with the center of the U-shaped recess 54 in alignment with the axis of the threaded lower end portion 52 of set screw 42. The recess extends sufficiently along the length of aperture 40 so that it is in vertical alignment with the press screw. Thus, when set screw 42 is threaded downward into engagement with stud 38 as shown in FIGS. 2 and 3, it will engage the top of the stud 38 and the stu[d] bottom will be engaged at two points, the two edges 56 and 58 at both sides of the U-shaped groove 54. A three point contact is made with the stud 38 with points 56 and 58 being offset from the direct vertical point contact at the end of set screw 42 so that a triangular configuration of forces is provided to hold the stud in position and resist movement from any forces applied to the connector [column 3, lines 26 through 43].

Combining Ashcraft and Kraft to reject the appealed claims, the examiner submits that it would have been obvious “to modify the bottom of stud receiving passageway [38] of Ashcraft et al. and provide a smooth or unthreaded arcuate passageway at the bottom as taught by Kraft, so that a triangular configuration of forces is provide[d] to hold the stud in position” (answer, pages 3 and 4). Ashcraft, however, effectively teaches away from any such modification by criticizing the triangular locking arrangement disclosed by Kraft as providing minimal surface area pressure contact between the connector and the transformer stud (see Ashcraft at column 1, lines 51 through 55). Ashcraft maximizes this surface area of pressure contact by providing the slip-fit hole in the connector with arc recesses which are sized and threaded to match the threads on different size studs. The proposed modification of the Ashcraft connector in view of Kraft would actually decrease this desired surface area of pressure contact, and hence lower the quality of the mechanical and electrical connection afforded by Ashcraft’s blind hole design. In this light, it is apparent that the only suggestion for combining Ashcraft and Kraft in the manner advanced by the examiner stems from hindsight knowledge impermissibly derived from the appellant’s disclosure.

Accordingly, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of independent claims 1, 13, 18 and 26, and dependent claims 2 through 6, 8 through 12, 14 through 17, 19 through 25 and 27-33, as being unpatentable over Ashcraft in view of Kraft.

As indicated above, independent claim 34 recites a method for making a slip-fit electrical connector for a threaded transformer stud comprising, inter alia, the step of forming a transformer stud receiving passageway by drilling at least one bore and forming at least one set of threads along surfaces of the bore “using helical interpolation.” The use of helical interpolation to form threads is a well known expedient in the milling art whereby, as acknowledged by the appellant, “a thread milling machine causes two axes to move in a circular path as a third axis moves in a linear path as will be appreciated by those skilled in the art” (specification, page 10). In rejecting claim 37, the examiner chose not to cite this prior art practice as evidence of obviousness. Instead, the examiner relies solely on the combined teachings of Ashcraft in view of Kraft to make the rejection, but fails to cogently explain how or why such teachings would have suggested the use of helical interpolation specified in the claim. The examiner’s position that the subject

claim limitation is met merely because the corresponding threads disclosed by the references are helical in nature (see page 5 in the answer) finds no evidentiary support in either reference.

Therefore, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of independent claim 34, and dependent claims 35 through 37, as being unpatentable over Ashcraft in view of Kraft.

II. Remand to the examiner

The application is remanded to the examiner to determine whether Ashcraft and/or Kraft, considered in conjunction with the admitted prior art practice of forming threads by helical interpolation, would have rendered the subject matter recited in any one of claims 34-37 obvious within the meaning of 35 U.S.C. § 103(a), and if so to enter an appropriate rejection. Using claim 34 as an example, it would appear that the only difference between the subject matter claimed and that disclosed by Ashcraft lies in the recitation of helical interpolation to form the threads in the transformer stud receiving passageway.

SUMMARY

The decision of the examiner to reject claims 1 through 6 and 8 through 37 is reversed, and the application is remanded to the examiner for further consideration.

REVERSED AND REMANDED

JOHN P. MCQUADE Administrative Patent Judge	)	
JEFFREY V. NASE Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JENNIFER D. BAHR Administrative Patent Judge	)	

JPM/kis

ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST, P.A.
1401 CITRUS CENTER 255 SOUTH ORANGE AVENUE
P. O. BOX 3791
ORLANDO, FL 32802-3791