

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER SUNG YAN YU

Appeal 2006-2567
Application 10/063,464
Technology Center 3600

Decided: March 17, 2008

Before: TERRY J. OWENS, JENNIFER D. BAHR and
STEVEN D.A. McCARTHY, *Administrative Patent Judges.*

McCARTHY, *Administrative Patent Judge.*

DECISION ON APPEAL

1 STATEMENT OF THE CASE

2 The Appellant appeals under 35 U.S.C. § 134 (2002) from the final
3 rejection of claims 1-8, 12 and 15. We have jurisdiction under 35 U.S.C.
4 § 6(b) (2002).

1 The application on appeal concerns a fuse connector designed to solve
2 “the problems associated with the tying of fuses from two or more separate
3 firework devices in order to achieve a sequential detonation of the same.”
4 (Spec. 1-2, ¶ 0005, ll. 1-3). The preferred connector includes a hollow
5 tubular member. “The device is sized and shaped appropriately to receive
6 fuses from two separate firework devices such that the fuses are positioned
7 substantially coaxially and adjacent to one another within the connector.”
8 (Spec. 2, ¶ 0005, ll. 4-7).

9 Independent claim 1 is representative of the Appellant’s claims and
10 reads as follows:

11
12 1. A device for connecting the fuses of
13 at least two firework devices, said device
14 comprising a hollow tubular member having a first
15 end and second end with an interior surface
16 defining a continuous hollow interior extending
17 between the first and second ends, the tubular
18 member adjacent said first and second ends being
19 sized and shaped to slidingly and securely receive
20 and retain a respective fuse end therein by
21 engagement between a fuse end portion and said
22 interior surface, to thereby permit the connection
23 of at least two aerial fireworks for successive firing
24 thereof by transferring flame from one fuse to the
25 other fuse through the hollow interior of the
26 tubular member.
27

28 Claims 1-8, 12 and 15 stand rejected under 35 U.S.C. § 112, ¶ 1
29 (2002) as failing to comply with the written description requirement. Claims
30 1-7 and 12 stand rejected under 35 U.S.C. § 112, ¶ 2 (2002) as being
31 indefinite for failing to particular point out and distinctly claim the subject

1 matter which the Appellant regards as the invention. Claims 1, 6, 8, 12 and
2 15 stand rejected under 35 U.S.C. § 103(a) (2002) as being unpatentable
3 over Peebles (U.S. Patent 5,515,784) in view of Hare (U.S. Patent
4 3,343,487). Claims 2 and 3 stand rejected under section 103(a) as being
5 unpatentable over Peebles in view of Hare and Burrows (U.S. Patent
6 2,475,875). Claim 4 stands rejected under section 103(a) as being
7 unpatentable over Peebles in view of Hare and Ambrico (U.S. Patent
8 6,499,405). Claim 5 stands rejected under section 103(a) as being
9 unpatentable over Peebles in view of Hare and McCaffrey (U.S. Patent
10 2,796,834). Claim 7 stands rejected under section 103(a) as being
11 unpatentable over Peebles in view of Hare and Yanda (U.S. Patent
12 6,196,131). Claims 1, 6, 8, 12 and 15 stand rejected under section 103(a) as
13 being unpatentable over Peebles in view of Bartholomew (U.S. Patent
14 4,742,773).

15 We reverse the rejection of claims 1-8, 12 and 15 under section 112,
16 ¶ 1. We reverse the rejection of claims 1-7 and 12 under section 112, ¶ 2.
17 We affirm the rejections of claims 1-8, 12 and 15 under section 103(a).

18

19

ISSUES

20 The six issues in this appeal are:

21 (1) Whether the Appellant's specification and drawings as originally
22 filed described "[a] device for connecting the fuses of at least two firework
23 devices" comprising a tubular member having an interior surface which is
24 sized and shaped adjacent the ends of the member "to slidingly and securely
25 receive and retain a respective fuse end therein by engagement between a
26 fuse end portion and said interior surface;"

1 (2) Whether claim 1 is indefinite because the manner in which the
2 phrase “at least two firework devices” recited in the preamble is intended to
3 relate to the phrase “at least two aerial fireworks” recited in the final
4 “thereby” clause is unclear;

5 (3) Whether a device “comprising a hollow tubular member” would
6 have been obvious to one of ordinary skill in the art from the teachings of
7 Peebles in view of either Hare or Bartholomew;

8 (4) Whether a device comprising a tubular member having an interior
9 surface which is sized and shaped adjacent the ends of the member “to
10 slidingly and securely receive and retain a respective fuse end therein by
11 engagement between a fuse end portion and said interior surface” would
12 have been obvious to one of ordinary skill in the art from the teachings of
13 Peebles in view of either Hare or Bartholomew;

14 (5) Whether Hare, Yanda and Bartholomew are analogous art; and

15 (6) Whether positioning a primer in the hollow interior of a tube
16 connector would have been obvious to one of ordinary skill in the art from
17 the teachings of Peebles, Hare and Yanda.

18

19

FINDINGS OF FACT

20 The record supports the following findings of fact (“FF”) by a
21 preponderance of the evidence.

22 1. Peebles discloses a detonation system for detonating a sequence
23 of pyrotechnic aerial shell devices. The reference teaches that “[s]uch
24 interconnected devices, in any desired pattern, may of course be used for any
25 suitable purpose including, without limitation, initiation of a sequence of
26 explosive charges in civil or military blasting or detonation operation, in

1 demolition blasting, in the sequential ejection of munitions, pyrotechnics or
2 the like from pod-like carriers for the same, etc.” (Peebles, col. 6, l. 62 –
3 col. 7, l. 4). The system makes use of shock tubes, that is, tubes having
4 interior surfaces coated with flammable materials and oxidizing agents.
5 (Peebles, col. 1, ll. 23-35).

6 2. Fig. 4 of Peebles shows three pyrotechnic launch tubes 30, 30’
7 and 30’’. Each of the pyrotechnic launch tubes has an input tube or fuse 40
8 and an output tube or fuse 42. Each such launch tube contains a propellant
9 base charge 36 such as black powder and a signal transmission tube relay
10 and initiator device 34 for detonating the charge. The output tube 42 of the
11 first pyrotechnic device 30 is connected to the input tube 40 of the second
12 pyrotechnic device 30’ by “a simple tube connector which places the distal
13 ends of connected tubes 42 and 40 in signal transfer relation to each other.”
14 (Peebles, col. 7, ll. 5-12 and 19-31). One of ordinary skill in the art would
15 understand that the “signals” which are transferred between the two distal
16 ends of the connected tubes include flame fronts. (*E.g.*, Peebles, col. 1, ll.
17 31-35; *accord*, Bartholomew, col. 1, ll. 54-59).

18 3. Peebles teaches igniting the input tube 40 of the first
19 pyrotechnic launch tube 30 with an igniter device. The input signal (that is,
20 the flame front conducted by the input tube of the first pyrotechnic device)
21 generates an outgoing signal in the output tube 42 and initiates after a
22 suitable delay the detonation of a charge in the first pyrotechnic launch tube.
23 This outgoing signal passes to the second pyrotechnic launch tube 30’
24 through the simple tube connector 46 and the input tube 40 of the second
25 pyrotechnic launch tube 30’. (Peebles, col. 7, ll. 36-47).

1 4. Hare teaches a pyrotechnic delay device for sequencing
2 functions such as canopy release and seat ejection in an aircraft emergency
3 escape system. (Hare, col. 1, ll. 27-37). The device includes a case. (Hare,
4 col. 1, l. 67 – col. 2, l. 1). The sole drawing figure appears to show the case
5 as a hollow cylindrical tube having a continuous cylindrical hollow which
6 extends between openings at both axial ends. The ends of the case are
7 crimped to retain the ends of mild detonating fuses in signal transfer relation
8 to each other within the case. (Hare, col. 1, l. 67 – col. 2, l. 1).

9 5. The case contains a lead tube filled with a delay composition.
10 A pair of washers holds a gasless igniter mixture against the axial ends of
11 the lead tube in communication with the delay composition. Each of these
12 washers appears cup-shaped in the drawing and contains a primary explosive
13 mixture which communicates through that washer with the gasless igniter
14 mixture. Paper disks cover the exposed ends of the washers so as to retain
15 the primary explosive mixture. (Hare, col. 2, ll. 1-10).

16 6. Burrows discloses a delay element connected between two lines
17 of detonating fuse. (Burrows, col. 2, ll. 16-29). The delay element is
18 enclosed within a paper tube. (Burrows, col. 3, ll. 38-41). Burrows teaches
19 that black powder may be used as a delay composition in the delay element.
20 (Burrows, col. 4, ll. 67-70).

21 7. Ambrico discloses a delay device for connecting the detonating
22 cords of fireworks. (Ambrico, col. 2, ll. 1-8). The delay device includes a
23 hollow plastic cylinder having internal walls coated with a flammable
24 material such as glued black powder. (Ambrico, col. 3, ll. 8-17).

25 8. McCaffrey discloses a short interval delay blasting device for
26 insertion between two lengths of detonating fuse. (McCaffrey, col. 2, ll. 16-

1 41). The device includes a casing constructed of copper or aluminum-based
2 alloy. (McCaffrey, col. 2, ll. 42-43).

3 9. Yanda discloses an initiator tip for use with a non-electric
4 shock tube initiation device. (Yanda, col. 1, ll. 62-63). The reference
5 teaches that a small quantity of gun powder may be used for transferring a
6 flame front in a shock tube. (*E.g.*, Yanda, col. 1, ll. 18-27).

7 10. Bartholomew discloses a transmission tube signal delay
8 assembly for transferring signals (that is, shock waves or flame fronts)
9 between shock tubes. (Bartholomew, col. 1, ll. 6-7; col. 1, ll. 54-59; and col.
10 2, ll. 5-7). The delay unit includes a hollow cylindrical aluminum housing
11 open at both axial ends. (Bartholomew, col. 3, ll. 42-44). The assembly
12 includes hollow cylindrical elastomeric bushings extending through the open
13 axial ends of the housing for receiving the ends of the shock tubes. The ends
14 of the shock tubes are retained in the housing by crimping the ends of the
15 housing so that the bushings grip the ends of the shock tubes. Alignment
16 cups align the ends of the shock tubes in communication with the transition
17 composition. (Bartholomew, col. 3, ll. 49-59 and col. 4, ll. 24-27).

18 11. The housing encloses a lead tube containing a shaped delay
19 charge. (Bartholomew, col. 4, ll. 1-3). Lead tubes containing shaped
20 charges of transition composition abut against the two axial sides of the tube
21 containing the shaped delay charge so that the delay charge communicates at
22 either axial end with the transition composition. The alignment cups face
23 the exposed axial ends of the lead tubes containing the transition
24 composition. (Bartholomew, col. 4, ll. 16-27).

PRINCIPLES OF LAW

1
2 A claim is subject to rejection for failing to meet the “written
3 description” requirement of section 112, ¶ 1 if the claim is amended to recite
4 subject matter not described in the specification and drawings as originally
5 filed. *TurboCare Div. of Demag Delaval Turbomachinery Corp. v. General*
6 *Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001); *Vas-Cath Inc. v. Mahurkar*,
7 935 F.2d 1555, 1564 (Fed. Cir. 1991) (holding that the written description
8 requirement may be met by the application’s drawings). “Although [the
9 applicant] does not have to describe exactly the subject matter claimed, . . .
10 the description must clearly allow persons of ordinary skill in the art to
11 recognize that [the applicant] invented what is claimed” as of the filing date
12 of the application. *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989)
13 (discussing the written description requirement in the context of a claim of
14 foreign priority).

15 A claim is subject to rejection under section 112, ¶ 2, if the claim fails
16 in “particular pointing out and distinctly claiming the subject matter which
17 the applicant regards as his invention.” Compliance with the definiteness
18 requirement of section 112, ¶ 2 facilitates the examination of applications by
19 the Patent & Trademark Office and ensures adequate notice to those of
20 ordinary skill in the art concerning the scope of issued claims. *Energizer*
21 *Holdings, Inc. v. International Trade Comm’n*, 435 F.3d 1366, 1369 (Fed.
22 Cir. 2006). A claim can provide adequate notice of its scope to those of
23 ordinary skill in the art only if one of ordinary skill in the art can interpret
24 and understand the language of the claim. Therefore, a claim is subject to
25 rejection under 35 U.S.C. § 112, ¶ 2, if the language of the claim, read in
26 light of the specification and the teachings of the prior art, is susceptible of

1 no reasonable interpretation. *See Datamize, LLC v. Plumtree Software, Inc.*,
2 417 F.3d 1342, 1347 (Fed. Cir. 2005); *In re Moore*, 439 F.2d 1232, 1235
3 (C.C.P.A. 1971).

4 A claim is unpatentable for obviousness under section 103(a) if “the
5 differences between the subject matter sought to be patented and the prior art
6 are such that the subject matter as a whole would have been obvious at the
7 time the invention was made to a person having ordinary skill in the art to
8 which said subject matter pertains.” In *Graham v. John Deere Co.*, 383 U.S.
9 1 (1966), the Supreme Court set out factors to be considered in determining
10 whether claimed subject matter would have been obvious:

11
12 Under § 103, the scope and content of the prior art
13 are to be determined; differences between the prior
14 art and the claims at issue are to be ascertained;
15 and the level of ordinary skill in the pertinent art
16 resolved. Against this background the obviousness
17 or nonobviousness of the subject matter is
18 determined.
19

20 *Id.*, 383 U.S. at 17.

21

22

ANALYSIS

23 A. *The Rejection of Claims 1-8, 12 and 15 Under Section 112, ¶ 1*
24 *for Failure to Meet the Written Description Requirement*

25 The Examiner concludes that the specification as originally filed did
26 not describe a device comprising a tubular member having an interior
27 surface which is sized and shaped adjacent the ends of the member to
28 slidingly and securely receive and retain a respective fuse end therein “by
29 engagement between a fuse end portion and said interior surface” as recited

1 in independent claim 1. Likewise, the Examiner concludes that the
2 specification did not describe a method including the step of providing such
3 a device as recited in independent claim 8. (Ans. 3). The Appellant
4 counters that these limitations are shown in Figs. 2 and 3 of the application
5 as well as described in the text of the specification. (Br. 10-11).

6 For example, the Appellant points out that the specification as
7 originally filed identified the subject matter of the application as:

8
9 a device for connecting the fuses of two firework
10 devices, said device comprising a tubular member
11 having a first end and a second end, said first end
12 and said second end each being sized and shaped
13 appropriately to slidingly and *securely receive* a
14 fuse end *therein*, to thereby permit the connection
15 of two aerial fireworks for successive firing
16 thereof
17

18 (Spec. 2, ¶ 0006, ll. 1-5 [emphasis added]).

19 This passage states that the device comprises a tubular member. A
20 “tube” or “tubular member” is hollow according to the common meanings of
21 the terms. WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY at 524 (G.
22 & C. Merriam Co. 1971) (“tube,” entry 1, def. 1: “a hollow elongated usu.
23 cylindrical body . . .”). Such a member necessarily has an interior surface.

24 The most pertinent common meaning of “securely” is “firmly fixed.”
25 ENCARTA Dictionary, http://encarta.msn.com/dictionary_/securely.html
26 (last visited February 28, 2008) (“secure,” def. 1). The phrase “said first end
27 and second end each being sized and shaped appropriately to . . . *securely*
28 *receive* a fuse end *therein*” [emphasis added] would have indicated to one of
29 ordinary skill in the art that the fuse ends must be received in such a manner

1 that they are retained, that is, firmly fixed inside the ends of the tubular
2 member. Neither the specification nor the drawings disclose the use of
3 adhesives or other means for retaining the fuse ends in the tubular member.
4 The only apparent means by which the tubular member might “securely
5 receive” the fuse ends consistently with the disclosure of the specification is
6 “by engagement between a fuse end portion and said interior surface.”

7 Therefore, the limitation of slidingly and securely receiving and
8 retaining a respective fuse end “by engagement between a fuse end portion
9 and said interior surface” was described in the originally filed specification
10 and drawings. On the record before us, the Appellant has shown that the
11 Examiner erred in rejecting independent claims 1 and 8 as well as dependent
12 claims 2-7, 12 and 15 under section 112, ¶ 1.

13

14 *B. The Rejection of Claims 1-7 and 12 Under Section 112, ¶ 2 As*
15 *Being Indefinite*

16 Independent claim 1 recites “[a] device for connecting the fuses of *at*
17 *least two firework devices.*” [Emphasis added.] The device which is the
18 subject matter of the claim includes a tubular member. The claim recites
19 that the tubular member adjacent its ends is “sized and shaped to slidingly
20 and securely receive and retain a respective fuse end therein by engagement
21 between a fuse end portion and said interior surface, to thereby permit the
22 connection of *at least two aerial fireworks* for successive firing
23 thereof” The Examiner concludes that the manner in which the phrase
24 “at least two firework devices” recited in the preamble is intended to relate
25 to the phrase “at least two aerial fireworks” recited in the final “thereby”
26 clause is indefinite. (Ans. 3).

1 The Appellant contends that claim 1 is not indefinite because the
2 phrase “at least two firework devices” is recited in the preamble and the
3 phrase “at least two aerial fireworks” is recited in the body of the claim. The
4 Appellant argues that:

5
6 [t]he function of the preamble of the claim is to
7 provide background information for the claimed
8 invention. It is only the body of the claim that
9 claims the invention. It would be improper in this
10 case to utilize the preamble as an antecedent for a
11 claimed element when the preamble is nothing
12 more than background for the claim language.
13

14 (Br. 12).

15 We agree with the Examiner that the clarity of claim 1 would be
16 improved if the claim were amended so as to indicate that the phrase “at
17 least two aerial fireworks” refers back to the same elements previously
18 recited as “at least two firework devices.” Nevertheless, our reviewing
19 Court has recognized that there are instances when a claim may not be
20 indefinite even though a recitation of an element fails to refer to back to an
21 antecedent recitation of the same element. *Energizer Holdings*, 435 F.3d at
22 1370-71.

23 Claim 1 recites a structure, namely, a “device for connecting at least
24 two firework devices.” Neither the “at least two firework devices” nor the
25 “at least two aerial fireworks” is positively recited; that is, neither is a
26 structural part of the device recited by the claim. The number of parts in the
27 device which is the subject matter of the claim would not change if the “at
28 least two firework devices” were construed to be separate items from the “at
29 least two aerial fireworks.”

1 The phrase “at least two firework devices” is broader than the phrase
2 “at least two aerial fireworks” and encompasses any firework devices falling
3 within the scope of the latter phrase. Given its broadest reasonable
4 interpretation, the preamble “[a] device for connecting the fuses of at least
5 two firework devices” is met if the device permits connecting the fuses of at
6 least two such devices. If the tubular member of the device which is the
7 subject matter of the claim were sized and shaped adjacent its ends “to
8 slidingly and securely receive and retain a respective fuse end therein by
9 engagement between a fuse end portion and said interior surface, to thereby
10 permit the connection of at least two aerial fireworks,” the device which is
11 the subject matter of the claim necessarily would permit connecting the fuses
12 of “at least two firework devices.” Hence, the scope of claim 1 as a whole is
13 clear despite any uncertainty in the relationship of the “at least two aerial
14 fireworks” and the “at least two firework devices.”

15 On the particular record before us, the Appellants have shown that the
16 Examiner erred in rejecting claim 1 under section 112, ¶ 2 as being
17 indefinite. Likewise, the Appellants have shown that the Examiner erred in
18 rejecting dependent claims 2-7 and 12 under section 112, ¶ 2. Our
19 conclusion is not an endorsement of the practice of failing to identify an
20 antecedent of a claim element, whether or not the antecedent is recited in the
21 preamble of a claim.

22
23 C. *The Rejection of Claims 1, 6, 8, 12 and 15 Under Section*
24 *103(a) As Having Been Obvious from Peebles and Hare*

25 The Appellant contends that the subject matter of independent claims
26 1 and 8 differs from the teachings of Peebles in that Peebles does not teach a

1 device comprising a hollow tubular member. (Br. 12). In Fig. 4 and the
2 accompanying text, Peebles teaches that the output tube 42 of a first
3 pyrotechnic device 30 is connected to the input tube 40 of a second
4 pyrotechnic device 30' for successive firing thereof by a "simple tube
5 connector which places the distal ends of connected tubes 42 and 40 in
6 signal transfer relation to each other." (FF 2). As noted earlier, a "tube"
7 necessarily is hollow and has an interior surface.

8 The Appellant also contends that the subject matter of claims 1 and 8
9 differs from the teachings of Peebles in that the reference does not teach a
10 device comprising a tubular member having an interior surface which is
11 sized and shaped adjacent the ends of the member "to slidingly and securely
12 receive and retain a respective fuse end therein by engagement between a
13 fuse end portion and said interior surface." (Br. 12). We agree with the
14 Examiner's finding (Ans. 3 and 10-11) that this limitation is taught by Hare.
15 Despite a suggestion to the contrary in the Examiner's Answer (Ans. 11), the
16 Appeal Brief does not appear to dispute this latter finding.

17 Hare teaches a pyrotechnic delay device for sequencing functions
18 such as canopy release and seat ejection in an aircraft emergency escape
19 system. (FF 4). The Appellant contends that Hare is nonanalogous art. (Br.
20 10-11).

21 The established precedent of our reviewing Court sets up a two-fold
22 test for determining whether art is analogous: "First, we decide if the
23 reference is within the field of the inventor's endeavor. If it is not, we
24 proceed to determine whether the reference is reasonably pertinent to the
25 particular problem with which the inventor was involved." *In re Deminski*,
26 796 F.2d 436, 442 (Fed. Cir. 1986). A recent U.S. Supreme Court opinion

1 hints at a broader test: “Under the correct analysis, any need or problem
2 known in the field of endeavor at the time of invention and addressed by the
3 patent can provide a reason for combining the elements in the manner
4 claimed.” *KSR Int’l, Inc. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742 (2007). One
5 determines whether a prior art reference is within the same field of endeavor
6 as the subject matter of a claim by comparing the structure and function of
7 the subject matter recited in the claim to that of the subject matter disclosed
8 in the reference. *In re Bigio*, 381 F.3d 1320, 1326 (Fed. Cir. 2004).

9 Hare is within the Appellant’s field of endeavor. Hare’s pyrotechnic
10 delay device performs the same function as the device which is the subject
11 matter of claim 1 as well as the device provided in the “connecting” step of
12 claim 8. All three place the ends of fuses in relation with each other so that
13 a signal (that is, a flame front) may transfer from one fuse to another reliably
14 inside a tubular member. Hare’s teaching of additional capability, namely,
15 the capability to delay and thereby sequence the detonations of multiple
16 cartridge activated devices as well as the capability to seal the ends of the
17 fuses from the environment, does not alter the fundamental structural and
18 functional similarity between the devices. Therefore, Hare is analogous art.

19 The Appellant appears to dispute the Examiner’s conclusion that
20 “Applicant is substituting one hollow tubular transfer member for another in
21 an analogous art setting as explicitly encouraged by the primary reference
22 (see col. 7, lines 22-26 of Peebles).” (Br. 13, quoting Office Action, Sept. 9,
23 2004 at 5). To the extent that the Appellant is contending that “[t]here is no
24 suggestion or direction in the references to support their combination as
25 presented by the Examiner . . .” (Br. 5), we note that, “if a technique has
26 been used to improve one device, and a person of ordinary skill in the art

1 would recognize that it would improve similar devices in the same way,
2 using the technique is obvious unless its actual application is beyond his or
3 her skill.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740 (2007).¹
4 Hare would have suggested crimping the ends of Peebles’ simple tube
5 connector for the same reason that Hare teaches crimping of the ends of
6 Hare’s case, namely, to provide a relatively simple and inexpensive means
7 for retaining the ends of the fuses in signal transfer relation with each other.

8 On the record before us, the Appellant has not shown that the
9 Examiner erred in rejecting claims 1 and 8 as being unpatentable over
10 Peebles in view of Hare. Likewise, the Appellant has not shown that the
11 Examiner erred in rejecting dependent claims 6, 12 and 15 as unpatentable
12 over the teachings of those references. *In re Dillon*, 919 F.2d 688, 692 (Fed.
13 Cir. 1990) (*en banc*).

14

15 *D. The Rejection of Claims 2 and 3 Under Section 103(a) As*
16 *Having Been Obvious from Peebles in View of Hare and*
17 *Burrows*

18 The Appellant states that “[t]he arguments applied above regarding
19 the combination of Peebles and Hare, Jr. et al. apply equally to this

¹ The Appellant contends that “the rejections of the claims over art is legally deficient because there is not even a contention as to who is one skilled in the art.” (Br. 15). The absence of explicit findings concerning the level of ordinary skill in the art is not reversible error if the prior art references relied on by the Examiner reflect a sufficient level of skill to support the rejection. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“[T]he absence of specific findings on the level of skill in the art does not give rise to reversible error where the prior art itself reflects an appropriate level and a need for testimony is not shown.” [Internal quotation marks omitted]).

1 combination of references to support the rejection of Claims 2 and 3.
2 Patentability of the present invention is not based on the connector device
3 begin made of paper or cardboard but relies upon the structure of the device
4 itself as discussed above.” (Br. 14). The Appellant has not shown that the
5 Examiner erred in rejecting claims 2 and 3 for the reasons given above in
6 connection with the rejection of claim 1.

7

8 *E. The Rejection of Claim 4 Under Section 103(a) As Having Been*
9 *Obvious from Peebles in View of Hare and Ambrico*

10 The Appellant “concedes that the patentability of Claim 4 rests upon
11 the patentability of the claim from which it depends.” (Br. 14). The
12 Appellant has not shown that the Examiner erred in rejecting claim 4 for the
13 reasons given above in connection with the rejection of claim 1.

14

15 *F. The Rejection of Claim 5 Under Section 103(a) As Having Been*
16 *Obvious from Peebles in View of Hare and McCaffrey*

17 The Appeal Brief does not appear to argue the patentability of claim 5
18 separately from that of claim 1. The Appellant has not shown that the
19 Examiner erred in rejecting claim 5 for the reasons given above in
20 connection with the rejection of claim 1.

21

22 *G. The Rejection of Claim 7 Under Section 103(a) As Having Been*
23 *Obvious from Peebles in View of Hare and Yanda*

24 The Appellant contends that positioning a primer in the hollow
25 interior of a tube connector would not have been obvious to one of ordinary
26 skill in the art from the teachings of Peebles, Hare and Yanda. (Br. 14-15).
27 The Examiner finds that Hare teaches “a primer located within the interior of

1 the tubular member to transfer the flame from one fuse to the other (20, 30,
2 26).” (Ans. 4). It is known in the art to provide a small charge to facilitate
3 initiation of the signal in an outgoing fuse during the transfer of a signal
4 between two fuses. (Peebles, col. 4, ll. 62-67). Similarly, Hare teaches the
5 use of a primary explosive mixture or primer 20 in combination with a
6 gasless igniter mixture to transfer a detonation signal from an incoming fuse
7 12 to a column of delay composition 30 and from the delay composition to a
8 high explosive core 34 of an outgoing fuse 12. (Hare, col. 2, ll. 11-21). In
9 light of Hare’s teaching, one of ordinary skill in the art would have found it
10 obvious to position a primer in a simple tube connector to facilitate ignition
11 of the outgoing signal during a signal transfer within the connector.

12 “[W]hen a patent claims a structure already known in the prior art that
13 is altered by the mere substitution of one element for another known in the
14 field, the combination must do more than yield a predictable result.” *KSR*
15 *Int’l*, 127 S.Ct. at 1740. Yanda teaches the use of a small quantity of
16 gunpowder as a medium for propagating detonation signals. (FF 9). This
17 teaching would have suggested to one of ordinary skill in the art to substitute
18 gunpowder for the primary explosive mixture or the delay composition
19 taught in the art to facilitate the transfer of a detonation signal from one fuse
20 to another. We disagree with the Appellant’s assertion that “gunpowder is
21 not an explosive” (Br. 15): Peebles teaches that black powder is sufficiently
22 explosive to serve as a propellant base charge for an aerial firework device.
23 (See FF 2). This teaching of Peebles’ would have suggested to one of
24 ordinary skill in the art that one might substitute a small quantity of black
25 powder for the primary explosive mixtures taught in Hare to facilitate
26 ignition of an outgoing signal during a signal transfer within a connector.

1 The Appellant also contends that Yanda is nonanalogous art because
2 “it is not a connector and is utilized in blasting, not fireworks.” (Br. 14).
3 We find that Yanda is within the Appellant’s field of endeavor. Peebles
4 suggests that systems including shock tubes and simple tube connectors may
5 be used for “initiation of a sequence of explosive charges *in civil or military*
6 *blasting or detonation operation*, in demolition blasting, in the sequential
7 ejection of munitions, *pyrotechnics* or the like from pod-like carriers for the
8 same, etc.” (FF 1, quoting Peebles, col. 6, l. 62 – col. 7, l. 4 [emphasis
9 added]). This teaching implies that one of ordinary skill in the art pertinent
10 to simple tube connectors for placing fuse ends in signal transfer relation
11 with each other would be familiar with civil blasting technology and would
12 look to that technology for guidance in connecting the fuses of pyrotechnic
13 display devices. In particular, we find that initiators for initiating detonation
14 signals and shock tubes for conducting detonation signals are within the
15 same field of endeavor as devices for connecting fuse ends to transfer
16 detonation signals between the fuses.

17 On the record before us, the Appellant has not shown that the
18 Examiner erred in rejecting claim 7 under section 103(a) as being
19 unpatentable over Peebles in view of Hare and Yanda.

20
21 *H. The Rejection of Claims 1, 6, 8, 12 and 15 Under Section*
22 *103(a) As Having Been Obvious from Peebles in View of*
23 *Bartholomew*

24 The Appellant contends that “the arguments advanced regarding the
25 combination of Peebles with Hare, Jr. et al. apply equally to” the
26 combination of Peebles and Bartholomew. (Br. 15). Consequently, the
27 Appellant has not shown that the Examiner erred in rejecting claims 1 and 8

1 as being unpatentable over Peebles in view of Bartholomew for the reasons
2 given in connection with the rejection of those claims over Peebles in view
3 of Hare. With respect to the Appellant's contention that Bartholomew is
4 nonanalogous art (Br. 15), we find that technology for initiating a sequence
5 of explosive charges in the blasting industry is within the Appellant's field
6 of endeavor (*cf.* Peebles, col. 6, l. 62 – col. 7, l. 4) and that the capability of
7 Bartholomew's delay unit to delay detonation of an explosive charge does
8 not remove Bartholomew's teachings from that field of endeavor.
9 Bartholomew would have suggested crimping the ends of Peebles' simple
10 tube connector for the same reason that Bartholomew teaches crimping of
11 the ends of its own housing, namely, to retain the ends of the fuses in the
12 housing.

13 On the record before us, the Appellant has not shown that the
14 Examiner erred in rejecting claims 1 and 8 as being unpatentable over
15 Peebles in view of Bartholomew. Likewise, the Appellant has not shown
16 that the Examiner erred in rejecting dependent claims 6, 12 and 15 as being
17 unpatentable over the teachings of those references. *Dillon*, 919 F.2d at 692.

18 19 CONCLUSION OF LAW

20 On the record before us, the Appellant has shown that the Examiner
21 erred in rejecting claims 1-8, 12 and 15 under section 112, ¶ 1 for failure to
22 comply with the written description requirement. Likewise, on the record
23 before us, the Appellant has shown that the Examiner erred in rejecting
24 claims 1-7 and 12 under section 112, ¶ 2. The Appellant has not shown that
25 the Examiner erred in rejecting claims 1, 6, 8, 12 and 15 under section
26 103(a) as being unpatentable over Peebles in view of Hare and over Peebles

1 in view of Bartholomew; claims 2 and 3 under section 103(a) as being
2 unpatentable over Peebles in view of Hare and Burrows; claim 4 under
3 section 103(a) as being unpatentable over Peebles in view of Hare and
4 Ambrico; claim 5 under section 103(a) as being unpatentable over Peebles in
5 view of Hare and McCaffrey; and claim 7 under section 103(a) as being
6 unpatentable over Peebles in view of Hare and Yanda.

7

8

DECISION

9 We affirm all of the Examiner's rejections of claims 1-8, 12 and 15
10 under section 103(a). We reverse the rejection of claims 1-8, 12 and 15
11 under section 112, ¶ 1 and the rejection of claims 1-7 and 12 under section
12 112, ¶ 2.

13 No time period for taking any subsequent action in connection with
14 this appeal may be extended under 37 C.F.R. § 1.136(a) (2007). *See* 37
15 C.F.R. § 1.136(a)(1)(iv) (2007).

16

17

AFFIRMED

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19

20 vsh

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23

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