

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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(Serial No. 11/161,741)

**IN RE JIE XIAO**

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2011-1195

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Appeal from the United States Patent and Trademark  
Office, Board of Patent Appeals and Interferences

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Decided: October 12, 2011

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JIE XIAO, of Holbrook, New York, pro se.

RAYMOND T. CHEN, Solicitor, United States Patent  
and Trademark Office, of Alexandria, Virginia, for appel-  
lee. With him on the brief were LYNNE E. PETTIGREW and  
SCOTT C. WEIDENFELLER.

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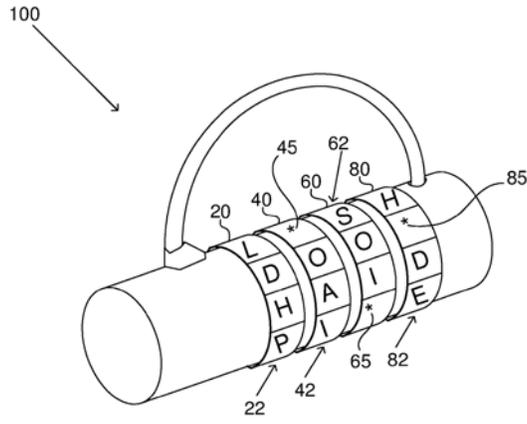
Before LOURIE, BRYSON, and DYK, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Jie Xiao (“Appellant”) appeals from the decision of the Board of Patent Appeals and Interferences (“the Board”) affirming the rejections of all pending claims of U.S. Patent Application No. 11/161,741 (“the ‘741 Application”) on the ground of obviousness. *See Ex parte Xiao*, No. 2009-008575 (B.P.A.I. Oct. 26, 2010) (“*Board Decision*”). Because the Board correctly determined that the claims would have been obvious to one of skill in the art, we affirm.

#### BACKGROUND

The ‘741 Application relates to combination locks having tumbler rings marked with letters rather than numbers. Such locks can be configured to open when a user aligns the letters on successive tumbler rings to spell a pre-selected “password,” which may prove easier to remember than an arbitrary series of numbers or letters. But the complement of available passwords is limited by the letters provided on each tumbler ring, and representing the full alphabet requires rings of sufficient size and complexity to accommodate at least twenty-six discrete positions. To expand the number of passwords possible with smaller tumbler rings, the ‘741 Application describes a combination lock having a non-alphabetic “wild-card” position label (*e.g.*, a star, dollar sign, or blank space) on each tumbler ring. In selecting a password, the wild-card position can be taken to represent any letter not expressly provided on a given ring—for example, a user could remember the combination “DOO\*” as “DOOR.”



DOOR

	Tumbler 1 22	Tumbler 2 42	Tumbler 3 62	Tumbler 4 82
Position 1	W	O	R	D
Position 2	S	A	M	E
Position 3	F	I	L	M
Position 4	C	E	N	T
Position 5	B	U	A	P
Position 6	L	T	E	N
Position 7	D	L	S	K
Position 8	H	R	O	L
Position 9	P	H	I	H
Position 10	*	*	*	*

25
45
65
85

'741 Application figs. 1A, 2.

The examiner rejected all pending claims, 1, 2, and 4-18, as obvious under 35 U.S.C. § 103(a) in view of U.S. Patent 2261 (“Gray”), U.S. Patent 4,395,892 (“Remington”), U.S. Patent 6,621,405 (“Basche”), and U.S. Patent Application Publication No. 2006/0169007 (“Fiegener”). Office Action of Oct. 10, 2007 (“*Office Action*”) at 3-6. Claim 1 is representative:

1. A briefcase comprising a combination lock, wherein the combination lock comprises:

a group of at least three tumbler rings, each tumbler ring operable to rotate and to settle at one of multiple predetermined positions and having multiple position-labels thereon each corresponding to one of the multiple predetermined positions, and wherein each tumbler ring has thereon only one wild-card position-label and multiple alphabetical-letter position-labels each being a single English alphabetical-letter, and the wild-card position-label is different from any one of the twenty-six English alphabetical-letters and is configured for representing any one of the twenty-six English alphabetical letters.

‘741 Application at 12.

In relevant part, the examiner determined that Gray discloses every element of the claimed lock except a wild-card position label different from and configured for representing any letter, and that Fiegener teaches that position labels can be any symbol or letter that is distinguishable from another as a matter of design choice. *Office Action* at 3-4. Furthermore, the examiner consid-

ered the wild-card position label to be mere printed matter, unrelated to the function of the claimed lock and thus not entitled to patentable weight. *Id.* at 3, 7.

The Board affirmed the examiner’s rejections. The Board first noted that Appellant had asserted identical arguments regarding each claim on appeal, drawn primarily to whether requiring “only one wild-card position-label and multiple alphabetical position-labels” rendered the claims nonobvious over the cited art. *Board Decision* at 3. The Board therefore considered this the only issue presented and selected claim 1 as representative for purposes of the appeal. *Id.* Proceeding to the merits, the Board concluded that modifying Gray to include a non-alphabetic position label as disclosed in Fiegenger would have constituted no more than the substitution of interchangeable elements with predictable results and thus would have been obvious to one of ordinary skill in the art. *Id.* at 4-5. Furthermore, the Board reiterated that the claimed wild-card position labels are printed matter that cannot distinguish over the cited prior art because “any printed matter, letter, figure, number, other mark or blank space may serve as a ‘wild-card’ without any alteration of how the lock functions since what symbol constitutes a ‘wild-card’ is a distinction that is discernable only to the human mind.” *Id.* at 6.

Appellant filed a timely appeal, and we have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

#### DISCUSSION

Under § 103(a), “[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time

the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2006). Obviousness is a question of law based on underlying factual findings, which include (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) evidence of secondary factors, such as long-felt need and commercial success. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). Accordingly, we review the Board’s factual findings for substantial evidence but consider its ultimate conclusions on obviousness *de novo*. *In re Gartside*, 203 F.3d 1305, 1315-16 (Fed. Cir. 2000).

First, the Board found, and Appellant does not dispute, that (1) Gray discloses a combination lock having tumbler rings bearing letters and blank spaces as position labels, and (2) Fiegenger teaches letters, numbers, ciphers, symbols, colors, patterns, textures, or any combination thereof for use as position indicators on a combination lock. *Board Decision* at 3-4. In general, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Appellant’s arguments to the contrary largely depend on distinguishing the ‘741 Application from the cited references based on using a wild-card position label to represent any letter to the user. Thus, we turn to whether the claimed wild-card position labels are entitled to patentable weight.

We agree with the Board that the claimed wild-card position labels constitute printed matter that cannot be used to distinguish the prior art. We have held that patent applicants cannot rely on printed matter to distinguish a claim unless “there exists [a] new and unobvious

functional relationship between the printed matter and the substrate.” *In re Gulack*, 703 F.2d 1381, 1386 (Fed. Cir. 1983). Relying primarily on *In re Miller*, 418 F.2d 1392 (CCPA 1969), Appellant argues that the wild-card position labels exhibit a synergistic functional relationship with the claimed lock and should thus be accorded patentable weight. *See* Br. of Appellant at 21-26. Specifically, Appellant asserts that (1) the wild-card labels render the claimed lock physically different from and improved relative to preexisting designs, (2) the wild-card labels function as more than simple position markers because they can represent any letter and thereby enable users to select any desired password even where each tumbler ring has less than twenty-six positions, and (3) the Board created an unsupported and improper rule categorically excluding “mental distinctions” from the patentability analysis. *Id.*

We disagree. First, Appellant’s arguments based on physical distinctions are unavailing because, as explained in *Miller*, “what is significant here is not structural but *functional* relationship” between the printed matter and the substrate. *Miller*, 418 F.2d at 1396 (emphasis in original).

More importantly, the wild-card labels lack a true functional relationship with the claimed lock. In *Miller*, a patent applicant had claimed devices for preparing fractional portions of recipes, such as measuring cups bearing (1) volumetric indicia different from actual volume and (2) a legend providing the ratio between the actual and indicated volumes. *Id.* at 1394. Thus, to prepare a one-third portion of a given recipe, a user could select measuring devices bearing a “1/3 recipe” legend and follow the recipe as written, measuring each ingredient using the false indicia printed on the device but actually obtaining

one third of each specified amount without performing any calculations. *Id.* The claims had been rejected, with the “false indicia” and legend considered mere printed matter, but our predecessor court reversed and held that the functional interaction between the claimed cup, indicia, and legend yielded a new and nonobvious invention. *Id.* at 1396. Similarly, in *Gulack*, we reversed rejections against an educational device comprising a band or ring printed with numbers tracking a cyclic mathematical formula. *Gulack*, 703 F.2d at 1382-83. We held that the band and digits were functionally related because the band not only provided a substrate for the printed digits but also presented them as an endless loop, thus illustrating the cyclic nature of the formula. *Id.* at 1386-87.

*Miller* and *Gulack* thus both concerned printed matter interrelated with its substrate to an extent that the overarching invention’s function depended on their interaction. Just as a cook would have found *Miller*’s measuring cup counterproductive without its matched indicia and legend, *Gulack*’s mathematical device relied on combining its physical circularity and cyclical printed matter to achieve its educational utility. In contrast, Appellant’s claims demonstrate no such functional relationship between the wild-card position labels and the underlying lock. The claimed lock’s function turns solely on the physical alignment among tumbler rings, regardless of what may be printed at each position or how an individual user subjectively perceives any particular position label. In short, the presence or identity of a given position label has no bearing on the lock’s ultimate function, and the claimed device can be used in the same way and for the same purposes with or without wild-card position labels.

Finally, the Board did not create a new “mental distinctions” rule in denying patentable weight to the wild-card position labels. On the contrary, the Board simply expressed the above-described functional relationship standard in an alternative formulation—consistent with our precedents—when it concluded that any given position label’s function as a wild card is a distinction “discernable only to the human mind.” *Board Decision* at 6; see *In re Lowry*, 32 F.3d 1579, 1583 (Fed. Cir. 1994) (describing printed matter as “useful and intelligible only to the human mind”) (quoting *In re Bernhart*, 417 F.2d 1395, 1399 (CCPA 1969)). In sum, the Board correctly denied patentable weight to the claimed use of wild-card position labels to represent any letter on a combination lock.

Appellant’s remaining arguments charge the Board with improper hindsight reasoning and allege that various secondary considerations preclude a finding of obviousness. Appellant’s hindsight arguments center on alleged hindsight motivations for deriving wild-card labels able to represent any letter in a password, but, as discussed, the claimed wild-card function imparts no patentable weight and so cannot support such arguments. As to secondary considerations, the record lacks any evidence supporting Appellant’s allegations of long felt need or unexpected results.

#### CONCLUSION

Accordingly, we affirm the Board’s determination rejecting claims 1, 2, and 4-18 as unpatentable under 35 U.S.C. § 103(a).

**AFFIRMED**