UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte XIANG TAN, ZHENG LING, and LI-HAO CHEN

Appeal 2018-005835
Application 13/821,208
Technology Center 2100

Before ALLEN R. MacDONALD, NABEEL U. KHAN and
DAVID J. CUTITTA II, *Administrative Patent Judges.*

KHAN, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the
Examiner's decision to reject claims 2–23. We have jurisdiction under
35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

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[1] We use the word Appellant to refer to "applicant" as defined in 37 C.F.R.
§ 1.42(a). Appellant identifies the real party in interest as EntIT Software
LLC. Appeal Br. 1.

CLAIMED SUBJECT MATTER

Appellant describes the invention as relating to:

A method for recognizing software applications installed on hardware devices includes scanning a hardware device to discover a target software application installed on the hardware device, where the target application includes one or more files; retrieving one or more sample applications for comparison to the target application; determining a resemblance between the target application and each of the one or more sample applications; and identifying the target application based on the resemblance determination.

Abstract.

Claim 9, reproduced below, is illustrative of the claimed subject

matter:

9.   A method of a computer system for recognizing software applications installed on hardware devices, comprising:

scanning a hardware device to discover a target software application installed on the hardware device, wherein the target software application comprises one or more files;

retrieving sample software applications from a sample application database for comparison to the target software application, the sample software applications being distinct from the target software application;

determining a type of application of the target software application;

selecting a subset less than all of the sample software applications that correspond to the determined type of application, the sample software applications of the selected subset being of the determined type of application, the selected subset comprising a first sample software application and a second sample software application, wherein the first sample software application and the second sample software

application are different versions of a particular software
application;

determining a resemblance between the target software
application and each of the selected sample software
applications in the subset; and

identifying the target software application based on the
determining of the resemblance between the target software
application and each of the selected sample software
applications in the subset.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Rabin	US 7,287,159 B2	Oct. 23, 2007
Hess	US 7,451,162 B2	Nov. 11, 2008
Anuszczyk	US 8,037,195 B2	Oct. 11, 2011

REJECTION

Claims 2–23 stand rejected under 35 U.S.C. § 103(a) as unpatentable
over Anuszczyk, Rabin, and Hess. Final Act. 3–24.

OPINION

Claim 9

Appellant argues, "The implication of claim 9 is that the target
software application discovered by the initial 'scanning' task is **not
identified**, i.e., not known." Appeal Br. 7. In contrast, Appellant argues,
"the 'model-based discovery' of 'components' (i.e., applications) in
Anuszczyk first constructs a model of a component **that is known.**

Anuszczyk refers to 'inspecting the actual contents of the IT system to see if components are present that match the fingerprint of the **model of the known component.**" Appeal Br. 8. Because "the model used to discover other components has already been constructed for a **known** component, the model-based discovery of Anuszczyk would have absolutely no need to perform the last 'identifying' clause of claim 9." Appeal Br. 8. In other words, Appellant argues, "the 'model-based discovery' of Anuszczyk compares components to a model of a **known component**, i.e., compares applications to a model of a **known application**. In contrast, according to claim 9, a resemblance is determined between sample applications and **the target software application that is initially un-identified, i.e., unknown**." Appeal Br. 8–9.

> In summary, Appellant argues,
>
> The sequence of tasks performed in Anuszczyk is the opposite of what is performed in claim 9. In claim 9, an unknown target software application is compared to known selected sample software applications in a subset, such that the target software application can be identified. In contrast, in Anuszczyk, a known application (represented by the fingerprint) is compared to unknown applications for discovering the unknown applications.

Appeal Br. 13; *see also* Reply Br. 8 ("The problem with the Examiner's interpretation is that in claim 9, multiple known sample applications (**including different versions** of a particular application) are matched to the unknown target application, whereas in Anuszczyk, one model of one known component is matched to multiple unknown installed (or existing) components.").

We are unpersuaded by Appellant's arguments. The Examiner finds Anuszczyk teaches a database of fingerprints and subfingerprints that are used to match installed software. Final Act. 3 (citing Anuszczyk 13:36–48, 12:6–18, 21:56–22:8, Fig. 12); *see also* Ans. 6–7 (citing Anuszczyk 21:56–22:14, Fig. 3). The Examiner maps the fingerprints and subfingerprints to the claimed sample software applications (Final Act. 3; Ans. 7) and the installed software applications to the claimed target software applications. (Final Act. 3, Ans. 6). The Examiner further finds that the set of fingerprints and subfingerprints comprise a first and second sample software application where the first and second software applications are different version of a particular software. Final Act. 5 (citing Anuszczyk 14:12–35, 23:34–55). The Examiner further finds Rabin teaches retrieving sample software applications from a sample application database for comparison to the target software application. Final Act. 6. The Examiner finds that in Rabin "a software is matched with a set of fingerprints from a fingerprint database representing software applications, the software to be compared interpreted as target software application and the set of fingerprints of software components interpreted as sample software applications." Final Act. 6 (citing Rabin Figure 1, 8:4–24, 9:61–10:7). Alternatively, the Examiner finds Anuszczyk could also be interpreted as teaching retrieving sample software applications for comparison to the target software application. Final Act. 6.

Appellant essentially acknowledges this mapping, with small differences (*see* Reply Br. 8), but argues that the sequence of tasks performed in Anuszczyk is the opposite of the sequence performed in claim 9. Appeal Br. 13. In other words, according to Appellant, in Anuszczyk a

match is attempted between a model (or fingerprint) of a known application to multiple unknown target applications, whereas in claim 9, a match is attempted between multiple known applications to an unknown target application. *See* Reply Br. 8.

This argument is unpersuasive for several reasons. First, Appellant does not take into account Examiner's findings regarding Rabin. The Examiner explicitly finds that Rabin teaches matching target software with a set of fingerprints from a fingerprint database where the set of fingerprints are mapped to the claimed set of sample software applications. Final Act. 6 (citing Rabin Figure 1, 8:4–24, 9:61–10:7). Thus, the combination of Anuszczyk and Rabin teaches the sequence of tasks Appellant argues as required by claim 9. In other words, even if in Anuszczyk a match is attempted between a known sample application and a set of target applications, one of ordinary skill in the art would have been able to modify Anuszczyk's teaching given Rabin's disclosure of attempting to match a target application to a set of known sample applications.

Second, and alternatively, we agree with the Examiner that Anuszczyk also teaches the sequence of tasks of claim 9. Anuszczyk discloses having a database of multiple fingerprints and subfingerprints that are used to identify installed software. *See* Anuszczyk 12:14–16 ("In the network server **10** of FIG. **3**, fingerprints can be contained in the database **130** of models, fingerprints, and rules"); 21:56–61 ("At block **204** of FIG. **9,** the fingerprints and subfingerprints are used to discover components in the IT system. Referring to FIG. **2,** the analysis service **70** of the agent **12,** including the rule engine **74,** accumulator **80,** and fingerprint database **84** can be used for the discovery of components at the agent-level.") The

Examiner finds that this database of multiple models, fingerprints, and subfingerprints are used to identify installed software. Final Act. 3–4, 6. Further, the Examiner finds that subfingerprints may be used to identify the version of the target software. Final Act. 4 (citing 14:12–35, 23:34–55). Thus, the Examiner finds that multiple fingerprints and subfingerprints are used to identify a target software application, as claim 9 requires.

Appellant next argues,

> the Examiner conceded that Anuszczyk and Rabin do "not explicitly disclose determining a resemblance between the target application and each of the one or more sample applications in the subset." Office Action at 7. This concession necessarily means that Anuszczyk and Rabin do not teach "identifying the target software application based on the **determining of the resemblance between the target software application and each of the selected sample software applications in the subset.**"

Appeal Br. 13. Appellant argues, "Hess refers to 'determining a degree of relevance of each data object to the data object of interest 810 or 'target.'" Appeal Br. 14, Hess, 9:58–60. Hess further states that "[r]elevance of information to a target data object may be determined from collected evidence." Hess, 12:17–18. However, Appellant argues, "like Anuszczyk and Rabin, Hess also does not provide any teaching or hint of 'identifying the target software application based on the determining of the resemblance between the target software application and each of the selected." Appeal Br. 14.

We are unpersuaded by Appellant's argument. The Examiner does not rely on Hess alone as teaching "identifying the target software

application based on the determining of the resemblance between the target software application and each of the selected sample software applications in the subset." Final Act. 7. Instead Hess is relied upon to teach the "determining a resemblance" element of the aforementioned limitation. This teaching, combined with the disclosures of Anuszczyk and Rabin teach the claim limitation as a whole. Because Appellant argues the references individually, without addressing the entirety of the Examiner's findings, we find Appellant's argument unpersuasive.

Accordingly, we sustain the Examiner's rejection of claim 9 and of independent claims 12 and 19, which were argued together. We also sustain the Examiner's rejection of claims 10, 18, and 21 for which Appellant does not make arguments for separate patentability.

Claim 2

Claim 2 depends from claim 9 and recites "wherein the determining of the resemblance is based on resemblance values, each resemblance value of the resemblance values based on a distance between the files of the target software application and corresponding files of each of the selected sample software applications." Appeal Br. i., Claims Appendix. The Examiner finds Rabin teaches determining a resemblance based on resemblance values by disclosing a Matching Ratio, defined as MatchingRatio = |CommonFinger|/|EitherFinger|. Final Act. 8 (citing Rabin 8:4–23). Alternatively, the Examiner finds Hess also teaches the aforementioned limitation by disclosing an "association between data objects based on weights" in the form of the following equation: $weight_{edge} = \sum_{e \, \varepsilon \, evidence}$ $weight_e * confidence_e * count_e$. Final Act. 8 (citing Hess 9:27–49).

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Appellant argues that the "value of MatchingRatio in Rabin is computed by dividing one number from another number" and that "[t]here is absolutely nothing in column 8 of Rabin that even remotely refers to a distance between the files of one application and files of another application." Appeal Br. 15. Similarly, Appellant argues that "Hess refers to calculating a weight factor that is based on a multiplication of 'the evidence weight, confidence, and count associated with the evidence" and that this provides "absolutely no teaching or hint of determining a resemblance based on resemblance values where each resemblance value is based on a **distance between the files** of the target software application and **corresponding files** of each selected sample software application." Appeal Br. 15.

We are unpersuaded by Appellant's argument. As the Examiner points out in the Answer, the Specification equates the "computed distance" to the resemblance value of a specific sample file set to the target file set. *See* Spec. ¶ 21 ("The computed distance (resemblance value) of a specific sample file set to the target file set is used to determine an identity of discovered software application to a sample software application."). Thus, without further limiting the claim, the term "distance" may be interpreted to encompass a measure of resemblance between two files or objects. Rabin's "MatchingRatio," does exactly that by providing a ratio between two fingerprints as a measure of their resemblance. *See* Rabin 8:4–23 (comparing two fingerprints to determine whether certain software matches other software by using the "MatchingRatio" equation.).

Accordingly, we sustain the Examiner's rejection of claim 2 and for the same reasons claims 3, 7, 8, 11, 13, 14, 22, and 23.

Claim 4

Claim 4 depends from claim 2 and further recites "wherein for target software application files q_i and sample software application files s_i, the distance is measured as $r(q, s) = \sum_{i=1}^{N} k_i |q_i - s_i|$ wherein $\sum_{i=1}^{N} k_i = 1$, and wherein k_i is a weight value for each respective attribute i." The Examiner finds Hess teaches this limitation by disclosing an equation of the "summation of weight times count of properties." Final Act. 9 (citing Hess 9:41–53; 10:1–15).

Appellant argues, "The cited column 10 passage of Hess calculates a score based on summing the weight factors. This equation also does not compute the difference between q_i and s_i and summing over i as claimed." Appeal Br. 16.

We are persuaded by Appellant's argument. Even if we agree with the Examiner that Hess discloses summations that are used to determine the resemblance of pieces of certain objects, it is clear that Hess does not teach or suggest an equation that is the same as or equivalent to the equation appearing in claim 4. In particular, there is no indication in the Examiner's findings that the way resemblance is measured in Hess is through summing the differences between target and sample software application files.

Accordingly, we do not sustain the Examiner's rejection of claim 4. For the same reason we also do not sustain the Examiner's rejection of claims 5, 6, 15–17.

Claim 20

Like claim 4, claim 20 also recites $r(q, s) = \sum_{i=1}^{N} k_i |q_i - s_i|$ wherein $\sum_{i=1}^{N} k_i = 1$. Appellant presents the same arguments for claim 20 as it does

for claim 4. For the same reasons, we do not sustain the Examiner's

rejection of claim 20.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
2–23	103(a)	Anuszczyk, Rabin, Hess	2, 3, 7–14, 18, 19, 21–23	4–6, 15–17, 20
Overall Outcome			2, 3, 7–14, 18, 19, 21–23	4–6, 15–17, 20

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with

this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R.

§ 1.136(a)(1)(iv).

AFFIRMED-IN-PART